96-144

OIL SHALE LEASING

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HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY RESOURCES AND MATERIALS PRODUCTION

OF THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

NINETY-SIXTH CONGRESS

SECOND SESSION

ON

S. 2858

A BILL TO AMEND SECTION 21 OF THE MINERAL LEASING ACT (41 STAT. 445), AS AMENDED (30 U.S.C. 241)

SEPTEMBER 9, 1980

Publication No. 96-144

Printed for the use of the
Committee on Energy and Natural Resources

U.S. GOVERNMENT PRINTING OFFICE
68-858 O WASHINGTON: 1980

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CONTENTS

	Page
S. 2858	2
Department of the Interior report	6

STATEMENTS

Armstrong, Hon. William L., a U.S. Senator from the State of Colorado	139
Ford, Hon. Wendell H., a U.S. Senator from the State of Kentucky	1
Hart, Hon. Gary, a U.S. Senator from the State of Colorado	13
Joseph, Hon. James A., Under Secretary, Department of the Interior, accompanied by Hon. Guy Martin, Assistant Secretary, Land and Water Resources, Department of the Interior	18, 25
Markey, Kevin L., representative, Friends of the Earth, Denver, Colo.	108, 115
Masselli, David, attorney, representative of the Sierra Club	86, 89
Miller, J. Blaine, president, Rio Blanco Oil Shale Co., Denver, Colo., accompanied by T. W. Eyck, vice president, community, government and public affairs	38, 51
Phillips, Paula C., regional counsel, Environmental Defense Fund, Denver, Colo	96, 98

OIL SHALE LEASING

TUESDAY, SEPTEMBER 9, 1980

U.S. SENATE,
SUBCOMMITTEE ON ENERGY RESOURCES
AND MATERIALS PRODUCTION,
OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10:05 a.m., in room 3110, Dirksen Office Building, Hon. Wendell H. Ford, presiding.

Present: Senators Ford, and Wallop.

Also present: Thomas L. Laughlin, professional staff member.

OPENING STATEMENT OF HON. WENDELL H. FORD, A U.S. SENATOR FROM THE STATE OF KENTUCKY

Senator FORD. Good morning, ladies and gentlemen. This morning's hearing is on Senator Hart's bill S. 2858, to permit the Secretary of the Interior to allow oil shale lessees to lease additional Federal lands for processing, waste disposal, and other nonmining purposes associated with the development of their existing tracts.

Similar legislation was considered by this committee 4 years ago. At that time, proponents of the change argued that the use of additional Federal lands would allow the recovery of more oil shale on leased lands.

However, based on an oil price of $7 a barrel, a USGS geologist calculated that the apparently preferred disposal site would result in a resource loss of approximately $10 million.

While Congress took no action on the earlier legislation, it is certainly possible that the use of additional Federal land would increase the recovery factor for lands under lease. This is a desirable result from a national energy supply point of view, provided other potential energy supplies are not thereby precluded from recovery or made substantially less attractive.

Other considerations include receipt of fair market value and environmental impacts. I certainly hope today's witnesses will address themselves to these basic questions.

I will place in the record at this time the text of S. 2858, the Department of the Interior report and a statement by Hon. Gary Hart.

[The text of the bill, department report, and statement of Senator Hart follows:]

II

96TH CONGRESS
2D SESSION

S. 2858

To amend section 21 of the Mineral Leasing Act (41 Stat. 445), as amended (30 U.S.C. 241).

IN THE SENATE OF THE UNITED STATES

JUNE 20 (legislative day, JUNE 12), 1980

Mr. HART introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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A BILL

To amend section 21 of the Mineral Leasing Act (41 Stat. 445), as amended (30 U.S.C. 241).

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a new subsection (d) is hereby added to section 21 of the Mineral Leasing Act (41 Stat. 445), as amended (30 U.S.C. 241), reading as follows:

"(d) The Secretary of the Interior is hereby authorized to grant to any person, association, or corporation, currently holding a lease for oil shale under the existing prototype leasing program, and under the provisions of subsection (a) of this

section, additional leases for lands outside the oil shale lease lands for any purpose, other than the actual mining of oil shale, connected with operations pursuant to that oil shale lease except that no additional leases may be granted for lands excluded from disposition by the provisions of section 1 of this Act. Any lease issued under this subsection (d) shall be granted only in connection with a specific oil shale lease issued under subsection (a) and only to the same parties as those owning that specific oil shale lease; the total land which may be leased under this subsection (d) in connection with any one oil shale lease issued under subsection (a) shall be not more than sixty-four hundred acres. Any lease under this subsection for any lands the surface of which is under the jurisdiction of a Federal agency other than the Department of the Interior shall be issued only with the consent of that other Federal agency and subject to such terms and conditions as that other Federal agency may prescribe. The additional land leased pursuant to this subsection may be used only for such purposes as the Secretary may prescribe in the lease which may include the disposal of oil shale waste and other materials removed from the lands leased under subsection (a), the building of plants, reduction works, and other facilities connected with the operations under the oil shale lease, and any other purposes connected with lease operations (except mining) which the Secretary may deem advis-

able. No mining of any kind may be performed under leases issued pursuant to this subsection. The Secretary shall not grant an additional lease (i) unless the Secretary has consulted with the Governor of the State in which the lands to be leased are located, (ii) unless the oil shale lessee shall demonstrate to the Secretary's satisfaction that the additional land is needed for proper operations under the oil shale lease and that he will be able to conduct all operations on the land leased under this subsection in an environmentally proper manner, and (iii) unless the Secretary shall determine that the issuance of the additional lease is in the public interest. Any lease issued under this subsection shall provide for the payment to the United States of an annual rental which shall reflect the fair market value of the rights granted and which shall be subject to such revision as may be needed from time to time to continue to reflect the fair market value. The leases issued under this subsection shall be for such periods of time as the Secretary may determine to be necessary for the purposes for which they are granted and shall contain such provisions as may be needed for proper environmental protection, including provisions requiring appropriate measures to restore and revegetate affected land and to protect fish and wildlife, recreational and agricultural values, and air and water quality. Lands leased under this subsection shall remain subject to leasing under the other provisions of this

Act where such leasing would not be incompatible with the lease issued under this subsection.".

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

SEP 10 1980

Honorable Henry M. Jackson
Chairman
Committee on Energy and Natural Resources
United States Senate
Washington, D. C.

Dear Mr. Chairman:

This responds to your request for this Department's views on S. 2858, a bill "To amend section 21 of the Mineral Leasing Act (41 Stat. 443), as amended (30 U.S.C. 241)."

While we do not object to enactment of S. 2858, we strongly recommend enactment of S. 3050, the Administration's proposal "To amend section 21 of the Act of February 25, 1920, commonly known as the Mineral Leasing Act", for the reasons set forth below.

S. 2858 and S. 3050 would both add a new subsection to the Mineral Leasing Act to authorize the Secretary of the Interior to lease additional lands to certain holders of oil shale leases to be used for any ancillary purpose related to oil shale production from the oil shale lease. There are differences in wording regarding use of the authority to lease additional lands, but generally these provisions are similar. The major difference between the bills is that S. 3050 is much more comprehensive and contains provisions which address other equally serious inadequacies in the law. We regard the enactment of these other provisions this year as of greater importance than passage of the additional leasing authority, if prototype oil shale leasing is to become successful and a permanent leasing program is to become a reality. It is for this reason we recommend enactment of of S. 3050 rather than S. 2858.

To fully appreciate why we believe these additional amendments are critical, we will briefly describe the oil shale leasing program that the Department is now preparing in response to the President's program to accelerate the development of a synthetic fuels industry.

The Department of the Interior has operated a Prototype Oil Shale Leasing Program for six years. The goals of the Program are to provide a new energy source by stimulating development of commercial oil shale technology, to develop a full range of environmental safeguards and reclamation techniques for incorporation into the planning of a mature oil shale industry, and to develop management expertise in the leasing and supervision of oil shale development. To date the program has been at best only a qualified success; although it has provided us with management experience, technical and environmental information are being obtained on only one technology in a single area of the oil shale region.

Because of the limited success of the Department's initial leasing effort, and because oil shale will play an important role in reaching national energy objectives, we conducted a thorough review of the Prototype Program. After a detailed presentation and discussion of the issues, we decided that additional leasing under the Prototype Program is necessary for us to gain the broader experience first sought in the Program when the six lease tracts were selected and offered in 1974. It was decided that we should lease up to four new tracts under the Prototype Program in order to obtain, through prototype leasing, the information and experience needed to design a permanent leasing program which meets our Nation's synthetic fuel needs while minimizing disruption to the environment, institutions, and lifestyles of the oil shale regions. Attainment of that success very heavily depends upon obtaining Congressional approval of the additional provisions in S. 3050 which are lacking in S. 2858.

The additional leasing we will undertake at this time, although primarily of value as a prototype effort, will also assist in reaching the President's goal. Figures compiled by this Department, the Department of Energy, and Environmental Protection Agency suggest that the President's 1990 production goal of 400,000 barrels per day production of shale oil may possibly be met from facilities on private lands, and existing prototype lease tracts. This production goal, however, is based on several favorable assumptions. By modest additional leasing under the Prototype Program, we will provide a measure of insurance against the failure of one or more of those assumptions to occur, and potentially foster additional production in the early 1990's. Because of the richness of shale on certain Federal lands, it is conceivable that it would make sense to develop a new tract on Federal land when a private tract on marginal private land goes undeveloped. Thus, the decision to offer up to four additional leases under the Prototype Program would not only strengthen the ongoing program, increasing the likelihood of successfully attaining program goals, but would encourage additional shale oil production.

Under the leadership of Assistant Secretary for Land and Water Resources Martin, working with Assistant Secretary for Energy and Minerals Davenport, a task force was established to recommend how the additional leasing might best be accomplished. We have developed a cooperative working relationship between the task force working groups and State and local governments, the industry, and environmental organizations. To the extent possible, meetings of these working groups have been held in or near the oil shale regions.

Based on the findings of the Task Force and further decisions that will soon be made, the Department will proceed with a schedule for leasing additional lands for oil shale development. In fact, the first steps toward a renewal of prototype leasing were approved last month.

To initiate the process for additional leasing, a call for expressions of industry interest in general areas and technologies was published in the Federal Register on August 18, 1980. After receiving expressions of industry interest, and developing criteria for tract delineation and selection, the Department will

call for formal nominations of specific tracts. That will be in about four months from now--on or about January 15, 1981. The Department will prepare environmental impact statements prior to reaching final decisions to issue further leases under the Prototype Program.

In completing the Prototype Program, we will try to ensure that the tracts chosen are located and designed so as to provide the full breadth of experience envisioned under the original Program. The tract or tracts offered for sale will be delineated to encourage bids from those companies that plan to use the technologies which need further evaluation under the extended Prototype Program. Although we would not constrain lease bidders or lessees by stipulating the technology to be employed, except possibly for the use of multi-mineral technology on at least one of the tracts, it is in the public interest to encourage companies to consider the use of a range of potential targeted technologies.

In order to reduce cumulative environmental and socio-economic impacts and to provide management and operating experience with recovery methods under differing conditions, Under Secretary James A. Joseph specifically directed that every effort will be made to avoid selecting tracts concentrated in one area. This will encourage consideration of tracts over the entire three-State area, enabling us to gain the vitally needed information and experience in handling differing resource conditions in this broad area, the technologies that are most suitable in extracting resources of differing quality, and the full range of effects flowing from different types of development in each area.

When dealing with oil shale, we believe that we must look beyond the President's 1990 production goal. For the health of a maturing industry and the energy security of the Nation, oil shale production must continue to expand in an environmentally sound manner in the 1990's and beyond. The largest and richest deposits of the resource are in Federal ownership or on private land interspersed with Federal lands, and development of even a modest-sized industry will be largely dependent on leasing beyond the Prototype Program. The volatile and uncertain international supply and price outlook for liquid hydrocarbons suggests that a permanent oil shale leasing program must be ready for implementation as soon as possible. Failure to initiate development of a permanent program increases the risk of encountering an emergency situation in the future that would require the quick development and implementation of a poorly designed "crash" leasing program, without adequate safeguards.

Accordingly, the Department is now beginning to develop a permanent leasing program, which we will complete and put in place within the next two years. After reviewing the Prototype Program and consulting with affected State and local governments, industry, the environmental community, and the public, we will develop and consider a full range of leasing alternatives.

This program and the actions we take under it will apply to leasing and development actions on public land managed by the Bureau of Land Management. The actions may affect other values and uses of the same lands. The Department,

through the Bureau, is charged with the difficult task of assessing resource use conflicts and ways of resolving them under provisions of the Federal Land Policy and Management Act (FLPMA), the National Environmental Policy Act of 1969, and a variety of other legislation and Executive Orders focused on protection of specific values and resources, such as threatened and endangered wildlife species. FLPMA requires the preparation of land use plans as a basis for major public land management decisions. The land use planning processes provide the means for assuring that oil shale development will reflect full consideration of other uses and values, and for facilitating coordination with plans of other Federal agencies, State and local governments, and other interests. Full public participation, of course, is required by law in the land use planning processes.

This planning process, through plan amendments, also will provide for timely action which will avoid delays in orderly development while still assuring analysis of multiple use impacts. Other impacted values will be considered in oil shale leasing and development decisions, and there will be full compliance with the National Environmental Policy Act of 1969, including preparation of a programmatic environmental impact statement.

These are this Department's objectives. However, to accomplish these objectives, a number of changes in ou current oil shale leasing authority are necessary. For this reason, the Administration proposed the amendments to Section 21 of the Mineral Leasing Act of 1920 that are contained in S. 3050.

With that background and indication of our plans for the future, we would like to describe S. 3050 in some detail and explain why we believe its enactment is of such great importance in enabling us to strengthen the Prototype Program and lay a foundation for the permanent oil shale leasing program.

First, S. 3050 would give the Secretary flexibility to issue an oil shale lease for an area larger than 5,120 acres--the maximum acreage now permitted in current law--where it is shown that a larger area is necessary to permit long-term commercial operations. In the long run, this new more flexible approach would ensure that lease tracts are of sufficient size to encourage economic development and efficient recovery of oil shale resources. It is also our view that enactment of this provision this Congress is absolutely essential to enable us to carry out the extended Prototype Program we have described to you. While it is our policy to disperse these leases as widely as possible, in the absence of authority to issue leases larger than 5,120 acres it is almost certain that we will receive nominations (beginning January 15, 1981) only in Colorado, and that we will be able to select tracts only in Colorado. This important consideration applies to both prototype and permanent leasing. Without this additional acreage authority, we do not expect we will receive serious nominations in Utah or Wyoming this January, or be able to lease in Utah and Wyoming to test technologies that, due to markedly different resource conditions, may differ substantially from those suitable in Colorado. Both Utah and Wyoming contain substantial oil shale resources, but the thickness of the pay zone and the quality of these resources would not generally provide sufficient recoverable oil shale to make development of a lease tract of only 5,120 acres economically feasible. For this same

reason, the Department has already unitized the two existing oil shale leases in Utah. Because of the higher quality of the resource in Colorado, we do not anticipate it will be necessary or justified to use this provision for Colorado tracts very much, if at all.

If we are not able to lease in Wyoming and Utah, then any additional prototype leasing will likely be totally concentrated in Colorado. This would also unnecessarily concentrate environmental and socioeconomic impacts. We strongly wish to avoid this prospect and we also want to gain experience in the other two States with different resource conditions. We, therefore, urge you to consider this provision as being the most necessary and most immediately needed change in our legislative authority.

Second, S. 3050 would remove the current limitation of one oil shale lease per person, association, or corporation. We believe that this limitation will seriously inhibit technological development, because it reduces interest in prototype leasing and encourages use of the most conservative methods which are known to be profitable by those who hold prototype leases. If it is not promptly modified, the success of our January call for nominations and additional Prototype Program lease offerings could be severely threatened. Even though we may see some variety in the technologies used, they will probably not be truly innovative if this provision is not adopted.

Approximately 80 percent of the oil shale resource in the Green River formation is found on Federal lands. Development of oil shale technology is extremely expensive and carries a very high degree of risk. With the current limitation of just one lease per company, it is unlikely that a company which receives a prototype lease will be able to apply the benefits of its research and development efforts to additional Federal oil shale resources until its initial lease expires. Interest in prototype lease offerings could be dampened considerably, if not lost entirely, if any company which heavily invests in pioneering oil shale technology cannot later reap the commercial benefits of its work through acquisition of another lease in the same area. We believe that the single lease limitation is certain to have this undesirable effect. We believe that raising this limit will serve to increase competition and participation in the Department's oil shale leasing program.

However, to prevent monopolistic practices, we believe that the total number of leases held by any single company in a State and nationwide should continue to be limited. For these reasons, we have recommended that the current limitation of one Federal lease be modified to provide only up to two leases in any one State and up to four leases nationwide.

For added flexibility, S. 3050 provides that when the resource on any lease is within 10 years of being depleted, the lessee may qualify for an additional lease. We believe this provision not only will permit economies of scale to be achieved in production with resulting economies in the price of final oil products, but also will help control and even out the cyclical nature of development effects, particularly on the small communities in the area that must contend with the potentially significant impacts of development.

The proposal would also provide that any leases issued in order to avoid bypassing small acreages of Federal oil shale resources, which could not otherwise be mined economically, would not be included in the limitations on oil shale lease ownership.

Third, S. 3050 would confirm and simplify the Secretary's existing authority to issue multi-mineral leases. We believe that an amendment clarifying our authority to issue multi-mineral leases is critical to the Prototype Leasing Program. Substantial quantities of saline minerals are associated with Piceance Creek Basin oil shale resources. Nahcolite holds great promise as a scrubbing agent in air pollution control equipment and dawsonite is a possible source of aluminum. While some of these minerals are bedded and could be avoided in the extraction of the shale, others occur in small pockets or are finely disseminated in the shale and will be removed with any development of the shale. Although nahcolite and halite can be separated before retorting, dawsonite can only be separated during retorting and only with certain retorting technologies. Thus, any decisions to recover dawsonite from shale must be made at the same time as decisions are made on the choice of shale retorting technologies.

Although the Department holds that it has the authority to lease the saline minerals along with the oil shale, the General Accounting Office has questioned this authority. In order to test multi-mineral technology and its environmental acceptability, and to prevent these other minerals from being left behind and wasted, the Department plans to issue at least one prototype lease that provides for multi-mineral development. If our authority to issue leases for multi-mineral development remains open to question, any such lease offering may be ignored or the winning bidder and the Department may be subject to litigation over the development rights the Department was authorized to award with parties asserting the GAO position. Enactment of S. 3050 would remove all question and allow us to proceed with multi-mineral leasing with assurance.

Finally, S. 3050 would authorize the Secretary to issue to any person, association, or corporation holding an oil shale lease issued prior to 1985, which would only include those leases issued within the Prototype Oil Shale Leasing Program, an additional lease or leases for disposal of waste shale and for siting facilities off the original lease area to facilitate the development of oil shale operations on leased lands. This provision is similar to S. 2858. However, there are several differences. Under S. 3050 the benefits of this authority would be available to any holder of an oil shale lease issued prior to 1985; under S. 2858 they would be available only to persons currently holding leases under the existing Prototype Program. S. 2858's provision would aid only four specific lessees, at most, only one of which would be likely to immediately benefit from this relief. Moreover, such a limitation would prevent the Department from offering new leases for use with any technology that would require the use of additional land.

Under S. 3050, the oil shale lessee would have to demonstrate that the additional lease is necessary and appropriate for its operations. Such leases would be subject to a variety of criteria and other safeguards. For example, no lease could be issued until the Secretary has considered the environmental and other

resource values, and other possible uses of the lands, and has made a determination that the public interest would be served by issuing that lease or leases. The Secretary would also require detailed reclamation plans for such areas. A lease issued under S. 3050 would be issued only for such period of time as the Secretary determines is necessary for the purposes of the lease, would contain such provisions as are needed for proper protection of environmental and other resource values, and would require the lessee to pay the fair market value for the lease. Provisions are also included to allow mineral leasing, for example, for oil and gas, if compatible, on the lands covered by the additional lease, to restrict transfer of these additional leases, and to allow inclusion of lands under any other agency's jurisdiction, with consent of that agency and subject to conditions imposed by that agency.

We note that S. 2858, while similar to S. 3050, includes several additional requirements that are not in S. 3050. S. 2858 would require the Secretary to consult with the Governor of the State in which the lands are located before granting an "off-site" lease, and would specify certain requirements that must be met to achieve proper environmental protection. We believe these provisions would be useful, and would, therefore, support amending S. 3050 to include them.

It is our view that providing for such "off-site" leases for the holders of pre-1985 oil shale leases would permit the most efficient mining of oil shale resources, especially in the richest areas, since mining tracts would no longer have to accommodate the processing facilities and spent shale, as well as the development operation itself. We have limited the availability of such leases to those who hold leases issued prior to 1985, which will include all of the leases issued under the Prototype Program. If, on the basis of the Prototype Program experience, it is determined that further authority is needed, we will seek such authority for leases issued during and after 1985.

We are pleased that both S. 2858 and S.3050 contain an off-site leasing provision, but we firmly believe the failure to enact the other provisions contained in S. 3050 this year will seriously impair our ability to successfully complete the Prototype Oil Shale Leasing Program and may well delay development of a permanent leasing program. Even though the one new authority included in S. 2858 is immediately helpful from the standpoint of one lessee, the three other provisions in S. 3050 are critically important to the Administration and to the numerous companies that we believe will be interested in nominating new prototype lease tracts in January. We, therefore, strongly urge favorable consideration of S. 3050 so that the Congress can enact it this year. A delay in your favorable consideration will, we believe, lead to a continuation of the mixed successes of the Prototype Leasing Program and to delays in permanent leasing.

The Office of Management and Budget has advised that there is no objection to the presentation of this report from the standpoint of the Administration's program.

Sincerely,

James A. Joseph

Under SECRETARY

Testimony by Senator Gary Hart
Re S.2858, Off-Tract Lands for Oil Shale Leases
Senate Committee on Energy & Natural Resources
Subcommittee on Energy Resources & Materials Protection
September 9, 1980

S. 2858 will allow the Department of the Interior, under very limited circumstances, to lease additional Federal lands to permit the construction of processing facilities on, or storing excess materials adjacent to, lands already leased for oil shale mining.

Under existing law, the Department of the Interior is prohibited from leasing land for this purpose. This legislation would allow land to be leased, provided various economic, environmental and resource conservation criteria are satisfied.

Additional but limited off-tract lands may be needed for economic reasons if the modified in-situ process is used, because the weight of the processing plant used to treat the shale rock brought to the surface may prevent the mining operations for in-situ processing underneath it. Alternatively, in the event that open-pit mining is undertaken, off-tract lands will be needed to hold overburden and spent shale as well as providing additional room for processing facilities.

Oil shale companies holding leases under the Department of the Interior's prototype lease program are now developing designs for above-ground processing plants. They need to know

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now if these plants can be sited off the existing tract so designs can be developed accordingly. This legislation would allow the companies to initiate construction of these early processing plants during 1981 and 1982.

The use of land for off-tract excess material deposits must be environmentally sound for the Department of the Interior to be able to enter into a lease. This legislation requires that a lease contain provisions for revegetation, protection of fish and wildlife, recreational and agricultural values, and air and water quality. This legislation would not change the need for environmental assessments or environmental impact statements under the existing National Environmental Policy Act.

Also, an off-tract lease must be in the "public interest," according to S.2858. This means, for example, that off-site disposal should not substantially affect the potential resource production from that storage area.

This country has no greater need than to reduce its dependence on imported oil. Shale oil represents a reasonable contribution to domestic energy production in the mid-to-late 1980's. We need to proceed with all deliberate speed to demonstrate the economic and environmental viability of various oil shale technologies. By passing this legislation this year, Congress will be making it possible for oil shale companies,

under the prototype lease program to initiate construction of surface processing facilities next year.

This is not a major departure in this government's leasing policy. However, it is vitally important for the economically practical development of the prototype lease tracts. I hope that the Committee will support this proposal.

The above comments apply to the bill I introduced, S. 2858. After this bill was introduced, the Administration proposed amendments to the Mineral Leasing Act which were considerably more extensive. After careful review of the Administration's proposals, I would like to express my views on how these proposals could be modified to achieve what the Department of the Interior intends, but also to ensure that negative consequences do not occur as a result of this legislation.

Larger Sized Leases

The existing law restricts the maximum size of oil shale leases to 5,120 acres. For large deposits such as those in the Piceance Basin in Colorado, this acreage size is more than enough to provide a commercial operation for many generations. A larger lease for these very rich oil shale areas would actually inhibit production because a company could not mine oil shale for perhaps over 100 or 200 years.

However, in other states such as Utah and Wyoming, the shale depositions are less rich. In these circumstances, it

may be necessary for a company to have a substantially larger lease in order to provide enough resource base to build a large commercial operation. Therefore, I suggest the Administration's legislative proposal be modified so that a larger lease could be granted only when the Secretary of the Interior determines a larger area is required to permit long-term commercial operations, in oil shale areas where the shale deposit is less than 150 feet thick, continuously with the quality of shale higher than 25 gallons per ton.

This modification of the Administration's proposal would not apply to most oil shale areas in Colorado, but would apply to most oil shale areas in Utah and Wyoming. Thus, the impact of this proposal would be to help disburse oil shale development in all three of the oil shale states in the West.

Numbers of Leases

Existing law restricts a company from holding more than one entire oil shale lease or the equivalent acreage of a 5120 acre oil shale lease in several joint ventures. This restriction is reasonable in the rich Piceance Basin of Colorado where a 5120 acre tract would allow probably more than 100,000 barrels of oil production a day for many generations.

Companies with one lease in neighboring states, such as in Utah, may not have enough land suitable for commercial development, and may need to bid for another lease in that state to pursue a fully commercial venture.

In order to allow for this eventuality, I suggest that the Administration's provisions for allowing companies to have more than one lease be limited to the case when the holder of an oil shale lease in one state has a lease which contains seam thickness of less than 150 feet, at a quality of greater than 25 gallons per ton. Under this circumstances, a lease holder could bid for another lease in that state.

Multi-Mineral Leases

I support the Department of the Interior's provision to authorize leases for oil shale allowing the mining and extraction of other mineral deposits in addition to the oil shale contained in the lands covered by the lease. All of the existing major oil shale ventures are concerned with the oil shale resource in the upper or Mohogany zone. There is a vastly larger oil shale resource in the deeper saline zone with the associated minerals nahcolite and dawsonite.

These resources which are so vast could be more economically profitable and perhaps more environmentally suitable than the ventures in the Mohogany zone. Therefore, the Department of the Interior should issue at least one lease to test processes on this resource.

Summary

Mr. Chairman, I urge the Energy Committee this year to provide authorities for off-tract sites associated with the existing prototype lease program.

While considering the subject of oil shale leasing, the Committee can make a valuable extension of existing legislation as recommended by the Administration with the modification I have suggested.

Senator FORD. The first witness this morning is Hon. James A. Joseph, Under Secretary of the Department of the Interior, and he is accompanied by Hon. Guy Martin, Assistant Secretary, Land and Water Resources, of the Department of the Interior. If you gentlemen would come forward, we would be very pleased to hear your testimony.

Mr. Secretary, you have a fairly lengthy statement and I don't object to it. I think you covered two pieces of legislation. If you want to highlight it, sometimes that's a mistake. If you don't read it, it takes longer, but if you want to highlight it, we will see that the total 13 pages will be included in the record as if given.

Mr. JOSEPH. Thank you very much, Mr. Chairman. I would like to submit my prepared statement for the record and summarize for you the key concerns which we bring to this hearing.

STATEMENT OF HON. JAMES A. JOSEPH, UNDER SECRETARY, DEPARTMENT OF THE INTERIOR, ACCOMPANIED BY HON. GUY MARTIN, ASSISTANT SECRETARY, LAND AND WATER RESOURCES, DEPARTMENT OF THE INTERIOR

Mr. JOSEPH. There are really two approaches before us which address shortcomings in the present provisions of law governing oil shale leasing on Federal land.

I have no basic objection to S. 2858, but it is far more limited than the administration's bill S. 3050. The leasing authority S. 2858 seeks is fine and necessary, but we need enactment of additional provisions of S. 3050 if prototype oil shale leasing is to be successful and a balanced leasing program a reality.

Mr. Chairman, I believe that oil shale can and will play an important role in reaching national energy objectives. It is for this reason that I recently authorized the review of our present prototype program. After a detailed consideration of the issues, I decided that additional leasing under the prototype program is necessary for us to gain the broader experience first sought when the six lease tracts were selected and offered in 1974.

I firmly believe that we need the information and experience we can gain from prototype leasing in order to design a permanent leasing program which meets our synthetic fuel needs while minimizing disruption to the environment, the institutions, and life-

styles of the oil shale regions, but I submit that we cannot gain the experience nor the information without additional changes in the law. So S. 3050, the administration bill, seeks four very important changes which I would like to summarize very briefly.

First of all, we need the flexibility to issue an oil shale lease for an area larger than 5,120 acres, the maximum now permitted by law. The only way we can prohibit undue concentration of environmental and socioeconomic impacts is to disperse these leases as widely as possible. Unlike Colorado, the oil shale resources in Utah and Wyoming are not of sufficient thickness or quality to make development of a lease tract of 5,120 acres economically feasible.

Second, Mr. Chairman, S. 3050 would remove the current limitation of one oil shale lease per person, association, or corporation. Interest in prototype lease offerings will be dampened considerably, if not lost entirely, if any company which would invest in a pioneering oil shale technology cannot later reap the commercial benefits of its work through acquisition of another lease in the same area. However, to prevent anticompetitive and monopolistic practices, we strongly support the idea of limits. For this reason, we recommend that the present limitation of one Federal lease be modified to provide for up to two leases in any one State and up to four leases nationwide.

Third, S. 3050 would confirm and simplify our authority to issue multimineral leases and thus to preserve and develop other important minerals, one which is used in pollution control equipment and the other as a possible source of aluminum.

Finally, S. 3050 would authorize us to issue to any person, association, or corporation holding an oil shale lease prior to 1985 an additional lease or leases for disposal of waste shale and for the siting of facilities off the original lease area. This is similar to the provisions of S. 2858, but with an important difference. That bill would make additional lands available only to holders of existing leases. We need to offer the same benefits to all lessees under our prototype program.

Mr. Chairman, that, in essence, summarizes my arguments in the longer statement which I have submitted. While we are pleased with S. 2858, it would only be helpful from the standpoint of present leases and only on one aspect of the problem we need to address.

The three other provisions I have discussed are important to the administration and to the numerous companies that will be interested in nominating new prototype lease tracts in January.

I believe that a mature oil shale industry will come either with the careful planning and protection we propose, or if not, on a crash basis without necessary environmental, economic, and social safeguards. We seek the authority to insure those safeguards.

I will be prepared at this point to answer any of your questions.

Senator FORD. Thank you, Mr. Secretary. I am a little bit puzzled, and that's not hard to do with me I guess, but you have in your statement on page 8 that S. 3050 would remove the current limitation of one oil shale lease per person, association, or corporation. You say, "It is our own conviction that this limitation will seriously inhibit the technological development because it reduces

interest in prototype leasing and encourages use of the most conservative methods which are known to be profitable."

The Public Land Review Commission found that a 5,120 acre tract may be too large in many cases since it would allow a single company to control an enormous resource and yet you are stating here that you would like to increase it beyond the 5,120 acres. It seems like you are in conflict with the Public Land Review Commission.

Mr. JOSEPH. The question of whether or not an acreage of 5,120 is economically sufficient depends on several variables. It depends on the quality of the resource and the thickness of the resource. We have a situation where, in Colorado, 5,120 acres would be probably sufficient because of the thickness of the resource and its quality; but if we are to consider leasing in Utah and Wyoming, where the resource is not nearly as thick, there are differences in the overburden, and there are differences in the quality, then in order to put together a commercial unit, it may be necessary in some cases to consider more than a 5,120 acre tract.

Now I am simply suggesting that we need the flexibility to look at what is economical in the various situations. I am not suggesting that we will immediately proceed to do that, but we need the flexibility to look at it.

The final thing I would say is that if we don't have this provision, we may end up with a concentration of socioeconomic and environmental impacts in Colorado where this acreage limitation is fine, but if we are going to disperse these impacts through oil shale development in several States, then we need the flexibility in order to be able to lease commercial units and economic units in the other States.

Senator FORD. You know, it depends on where you are coming from out of the Department of the Interior I have found. I was having a little running show with them as it relates to surface mining. They want us to go by the cookbook and you want the flexibility to make decisions as it relates to one State to the other.

Maybe we should define leases in terms of thickness and quality rather than acres. That's basically what you have said; 5,120 acres would be fine in Colorado, but the quality and the thickness and all that is much less in Wyoming so you ought to have the ability to go to maybe 10,000 acres or 7,500 acres or 15,000 acres, whatever your judgment might be as it relates to the quality of the product.

Have you given any thought to the acres and the quality?

Mr. JOSEPH. We feel that the best way to deal with the problem is to give the Secretary of the Interior the flexibility to deal with the acreage limitation; if we could find language to deal with the other problems that this acreage limitation seems to involve, without dealing with acreage limitation, I would be receptive to that, but I just can't imagine what kind of a language we could find to deal with the problem of the resource thickness and its quality.

It seems to me that the best way to go is to give the Secretary this authority.

Senator FORD. I have always heard this Secretary is all right, but we don't know what the next one is going to be like.

Mr. JOSEPH. Mr. Chairman, I think that there are necessary safeguards and limits on any Secretary, so that regardless who is

Secretary of the Interior, I think that the problem you are concerned about will be addressed.

Senator FORD. Are you saying then in your testimony that you think there should be a limit on the amount of shale oil which a single company can obtain?

Mr. JOSEPH. No; I said that there should be a limit on the number of leases for a single company in order to deal with the problems of monopoly, but I have said that that limit should be changed.

The present limit is one lease per State. I am saying that I think that there should be a limit, but it should be two per State and four nationwide, rather than the present limitation.

Senator FORD. Mr. Secretary, you are saying that you want the acreage allotment larger, in Wyoming than you do in Colorado because of the quality of the oil shale, and that would say that you are really going to give a company the opportunity to get this *x*, and that's your limit based on quality, and then you are going to limit them based on leases, two per State, four nationwide, so really what you are telling me is that we are not going to allow anybody to have any more than that?

Mr. JOSEPH. Yes.

Senator FORD. Even though they may have the ability and the next fellow may not have the ability and he is the next one up for leases or wants the lease, and so you have recruited a company with expertise and ability and the experience to move on what has been a quality producer.

Mr. JOSEPH. These companies are presently precluded. I am suggesting that we lift the severe limitation we now have.

Senator FORD. I am suggesting you may even go further than that.

Mr. JOSEPH. Then you get into the question of whether or not competition is being stifled by monopolistic practices of a few companies, which presents another problem. I think limits are necessary. All I am saying is that I think the limits that now exist are too severe.

Senator FORD. If my information is correct, Mr. Secretary, the Land Law Commission said that 50,000 barrels for 25 years should be the standard, so there is a standard in the ability to produce and it doesn't necessarily have a whole lot to do with acreage, 2,500 acres of rich area and 5,000 of less, so say in Wyoming it would give you the 25,000 or 50,000 barrels for 25 years.

Now there is a piece of language that you could put into the bill that would somehow give some sort of limitation. I am not sure that we could get into that, and you say maybe it would be hard to develop, but at least the Commission said the 50,000 barrels, 25 years would be the standard.

Mr. JOSEPH. Mr. Chairman, what I am saying is that our test for each tract, each lease rather, is that which is necessary for long-term commercial operations, and so I am not sure that we are necessarily differing there. What is necessary for long-term commercial operations is what we are talking about.

Senator FORD. Let me throw a couple of other things at you. Your potential criteria for amount of production and the number of years, the quality of production, number of years, I don't know how

you get to it, but what I think I am trying to get to is that the restrictions, regardless of who is in office, or the criteria regardless of who is in office, would have to follow something that we felt was equitable to all those who would participate and also give you some competition, too.

Is it going to be too difficult to come up with that kind of language in your estimation?

Mr. JOSEPH. Presently, Mr. Chairman, we are talking about leasing under an expanded prototype program. If we get around to talking about leasing under a permanent program, it would be based on considerable additional analysis in an Environmental Impact Statement and other sorts of analyses, but at this point we are primarily talking about the expanded prototype program, and the provisions that we are proposing have been developed to deal with that.

Senator FORD. As you well understand, Senator Hart is unable to be with us today. There is something like a primary in his State today, and in his testimony, in reading it, he says in his criteria a larger lease could be granted only when the Secretary of the Interior determines a larger area is required to permit long-term commercial operations in oil shale areas where the shale deposit is less than 150 feet thick continuously with the quality of shale higher than 25 gallons per ton.

Mr. JOSEPH. Mr. Chairman, on the face of that I wouldn't have any problem with that additional clarification in his language. I would want to look at it more carefully, but it sounds to me like he is addressing the same issue we are.

Senator FORD. That would eliminate the number of acres and that would at least give you the criteria on which to make the judgment of a larger number of acres?

Mr. JOSEPH. Yes. As I said, I want to look at it more carefully but on the face of it that seems all right.

Senator FORD. It makes a little sense to me I'll tell you. I like it. It looks like you might be able to find a middle ground on which we can come down that would make it easier for the Secretary whoever he might be, to make the judgment.

Mr. JOSEPH. Yes, sir.

Senator FORD. Would offsite leasing require an EIS in your judgment?

Mr. JOSEPH. I'm sorry?

Senator FORD. Would offsite leasing require an EIS in your judgment?

Mr. JOSEPH. Yes, it would require some environmental assessment, and then probably an environmental impact statement.

Senator FORD. How much land in your judgment would be needed if you got, say you gave a 5,100 plus acre lease, how much additional land for processing for the waste and so forth would be needed?

Mr. JOSEPH. That depends on the technology to be used. If it were surface retorting with all the spent shale to be disposed of on the additional land, it would differ from the modified in situ or in situ so it really depends upon the technology.

Senator FORD. Say I want to use the pit method.

Mr. JOSEPH. I think, as I recall, the estimate is that for 1 million barrels a day of oil shale you have about 1½ million tons of spent shale to dispose of, so that the acreage necessary would relate to that particular amount of spent shale.

Let me ask whether or not any of our people can tell you an exact figure.

Mr. MARTIN. I am told by one of our experts here, that the estimate for tract C-a was 6,400 acres which was slightly larger than the original tract itself. I think generally speaking, all I can say is that it will vary on a tract-by-tract basis, depending on the terrain of the original tract as well as the type of process, so it will be a specific issue in each case.

Generally speaking, I think that those additional lease tracts will not be larger than the initial tract. In the case of C-a, it happens that it is a little over 1 thousand acres larger, but generally speaking, I think they will be in about the same range.

Senator FORD. Do you think the 6,400 acres that you are alluding to, is that in section C-a, now that you are talking about?

Mr. MARTIN. That is their application.

Senator FORD. Do you think that would be the absolute maximum that would be needed?

Mr. MARTIN. No, sir. I don't think we could give you a definitive maximum at this point. If you would like us to try to develop one we can, but almost any single figure that we develop would undoubtedly not be able to take into account all future possibilities. If you desire to have some number developed we can do it and give you what limitations there are.

Senator FORD. If you are going to give me a number, that becomes the number, and I am very cautious about asking for a number under these circumstances. As we say down in Kentucky, each case is going to have to rest on its own bottom, and that may be what we are looking at here, and the judgmental ability of the Secretary is probably where we are going to have to come down. That may make more sense.

Mr. MARTIN. I think that would be all right.

Senator FORD. There is some fear about giving him too much rein or too much flexibility, but on the other hand, how in the world are you going to make it work unless you do have that? You just have to have some flexibility.

Mr. MARTIN. I think it is very possible that we can work out some language which limits that discretion. It is unlikely, for instance, that the amount of land needed will double the size of the lease. As I said, it is going to be usually less than the size of the initial lease.

Senator FORD. A million tons of shale will give 1½ million tons of overburden or residue?

Mr. JOSEPH. Yes.

Senator FORD. One and a half times? Of course, all of this will expand if you are using the pit method or surface mining. What process would we use if you have in situ? Would you need the same amount of acreage? Would it be basically the same?

Mr. JOSEPH. If some of the spent shale is being put back into the area from which it has been mined, then you obviously don't need as much additional acreage for disposal.

Senator FORD. I thought you might have to have something with the initial acreage.

Mr. JOSEPH. Yes. You would need something in order to get it started for the pit that you mine by conventional mining techniques, and if you surface retorted that, then you obviously would need some area in which to dispose of that.

Senator FORD. The initial acreage would be the larger number from then on?

Mr. JOSEPH. Yes.

Senator FORD. This is another factor, and we are guessing a little, and your educated guess is the best that we know.

How would the Secretary weigh the potential loss of Federal oil shale due to waste disposal on top versus a gain of recovery on a lease?

Mr. JOSEPH. How would he?

Senator FORD. How would the Secretary weigh the potential loss of Federal oil shale due to waste disposal on top of an area or in an area versus the gain of recovery on a lease? Say you have got 6,400 acres that you lease and 5,000 is for the shale and 1,400 is for disposal of waste. What loss will there be in that additional 1,400 acres for the disposal, if any? You wouldn't want to give them 1,400 acres that had nothing because you would want something contiguous I guess.

Mr. JOSEPH. We would have to subject any leasing of additional acreage to the same kind of analysis that we would do with leasing of any public land. That means we have to consider other values in addition to the oil shale value, and that land may be more valuable for some other use. Therefore we would subject it to the same planning process that we would subject any land that is about to be leased.

Senator FORD. Is this a Federal land management process that you are talking about now?

Mr. JOSEPH. Yes.

Senator FORD. I don't believe I have any other questions.

Mr. JOSEPH. Mr. Chairman, there is just one thing I would like to note. In our discussion about the need for additional acreage, we focused primarily, and I did to some degree, on the use of the land for disposing of spent shale, and we did not discuss the need in some cases for locating a facility offsite. I just wanted to add that in considering that additional acreage, we are talking about for both purposes.

Senator FORD. Both purposes?

Mr. JOSEPH. Yes.

Senator FORD. All right. I'm sure before we get through that there will be some questions that will develop, and Mr. Secretary, I will submit those to you in writing and we will expect your usual prompt reply.

Mr. JOSEPH. You may expect it, sir.

Senator FORD. Thank you very much, both of you, for being here today, and I appreciate your testimony very much.

[The prepared statement of Mr. Joseph follows:]

SEP 9 1980

"STATEMENT OF JAMES A. JOSEPH, UNDER SECRETARY OF THE INTERIOR, BEFORE THE SUBCOMMITTEE ON ENERGY RESOURCES AND MATERIALS PRODUCTION, COMMITTEE ON ENERGY AND NATURAL RESOURCES, ON S. 2858, A BILL "TO AMEND SECTION 21 OF THE MINERAL LEASING ACT (41 Stat. 445), AS AMENDED (30 U.S.C. 241)" AND S. 3050, A BILL "TO AMEND SECTION 21 OF THE ACT OF FEBRUARY 25, 1920, COMMONLY KNOWN AS THE MINERAL LEASING ACT."

I am pleased to be here this morning to discuss S. 2858, and the Administration's bill, S. 3050, both of which address shortcomings in the present provisions of law governing oil shale leasing on Federal lands.

Both bills would add a new subsection to the Mineral Leasing Act to authorize the Secretary of the Interior to lease additional lands to certain holders of oil shale leases to be used for any ancillary purpose related to oil shale production from the oil shale lease. There are differences in wording regarding use of the authority to lease additional lands, but generally these provisions are similar. The major difference between the bills is that S. 3050 is much more comprehensive and contains provisions which address other equally serious inadequacies in the law. We regard the enactment of these other provisions this year as of greater importance than passage of the additional leasing authority, if prototype oil shale leasing is to become successful and a permanent leasing program is to become a reality. It is for this reason we support enactment of of S. 3050 rather than S. 2858.

To fully appreciate why we believe these additional amendments are critical, first let me briefly describe the oil shale leasing program that the Department is now preparing in response to the President's program to accelerate the development of a synthetic fuels industry.

As you know, the Department has operated a Prototype Oil Shale Leasing Program for 6 years. The goals of the Program are to provide a new energy source by

stimulating development of commercial oil shale technology, to develop a full range of environmental safeguards and reclamation techniques for incorporation into the planning of a mature oil shale industry, and to develop management expertise in the leasing and supervision of oil shale development. To date the program has been at best only a qualified success; although it has provided us with management experience, technical and environmental information are being obtained on only one technology in a single area of the oil shale region.

Because of the limited success of the Department's initial leasing effort, and because oil shale will play an important role in reaching national energy objectives, we conducted a thorough review of the Prototype Program. After a detailed presentation and discussion of the issues, I decided that additional leasing under the Prototype Program is necessary for us to gain the broader experience first sought in the Program when the six lease tracts were selected and offered in 1974. I decided that we should lease up to four new tracts under the Prototype Program. I firmly believe that we must achieve a much greater degree of success in obtaining much needed information and experience through prototype leasing if we are to design a permanent leasing program which meets our Nation's synthetic fuel needs while minimizing disruption to the environment, institutions, and lifestyles of the oil shale regions. Attainment of that success very heavily depends upon obtaining Congressional approval of the additional provisions in S. 3050 which are lacking in S. 2858.

The additional leasing we will undertake at this time, although primarily of value as a prototype effort, will also assist in reaching the President's goal. Figures compiled by the Department of the Interior, the Department of Energy,

and Environmental Protection Agency suggest that the President's 1990 production goal of 400,000 barrels per day production of shale oil may possibly be met from facilities on private lands, and existing prototype lease tracts. This production goal, however, is based on several favorable assumptions. By modest additional leasing under the Prototype Program, we will provide a measure of insurance against the failure of one or more of those assumptions to occur, and potentially foster additional production in the early 1990's. Because of the richness of shale on certain Federal lands, it is conceivable that it would make sense to develop a new tract on Federal land when a private tract on marginal private land goes undeveloped. Thus, the decision to offer up to four additional leases under the Prototype Program would not only strengthen the ongoing program, increasing the likelihood of successfully attaining program goals, but would encourage additional shale oil production.

Under the leadership of Assistant Secretary Martin, working with Assistant Secretary for Energy and Minerals Davenport, a task force was established to recommend how the additional leasing might best be accomplished. We have developed a cooperative working relationship between the task force working groups and State and local governments, the industry, and environmental organizations. To the extent possible, meetings of these working groups have been held in or near the oil shale regions.

Based on the findings of the Task Force and further decisions I will soon make, the Department will proceed with a schedule for leasing additional lands for oil shale development. In fact, the first steps toward a renewal of prototype leasing were initiated with my approval last month.

To initiate the process for additional leasing, a call for expressions of industry interest in general areas and technologies was published in the Federal Register on August 18, 1980. After receiving expressions of industry interest, and developing criteria for tract delineation and selection, the Department will call for formal nominations of specific tracts. That will be in about four months from now--on or about January 15, 1981. The Department will prepare environmental impact statements prior to reaching final decisions to issue further leases under the Prototype Program.

In completing the Prototype Program we will try to ensure that the tracts chosen are located and designed so as to provide the full breadth of experience envisioned under the original Program. The tract or tracts offered for sale will be delineated to encourage bids from those companies that plan to use the technologies which need further evaluation under the extended Prototype Program. Although we would not constrain lease bidders or lessees by stipulating the technology to be employed, except possibly for the use of multi-mineral technology on at least one of the tracts, it is in the public interest to encourage companies to consider the use of a range of potential targeted technologies.

In order to reduce cumulative environmental and socio-economic impacts and to provide management and operating experience with recovery methods under differing conditions, I have specifically directed that every effort will be made to avoid selecting tracts concentrated in one area. My second reason for doing this is to encourage consideration of tracts over the entire three-State area. This will enable us to gain the vitally needed information and experience in handling

differing resource conditions in this broad area, the technologies that are most suitable in extracting resources of differing quality, and the full range of effects flowing from different types of development in each area.

When dealing with oil shale we must look beyond the President's 1990 production goal. For the health of a maturing industry and the energy security of the Nation, oil shale production must continue to expand in an environmentally sound manner in the 1990's and beyond. The largest and richest deposits of the resource are in Federal ownership or on private land interspersed with Federal lands, and development of even a modest-sized industry will be largely dependent on leasing beyond the Prototype Program.

The volatile and uncertain international supply and price outlook for liquid hydrocarbons suggests that a permanent oil shale leasing program must be ready for implementation as soon as possible. Failure to initiate development of a permanent program increases the risk of encountering an emergency situation in the future that would require the quick development and implementation of a poorly designed "crash" leasing program, without adequate safeguards.

Accordingly, the Department is now beginning to develop a permanent leasing program, which we will complete and put in place within the next two years. After reviewing the Prototype Program and consulting with affected State and local governments, industry, the environmental community, and the public, we will develop and consider a full range of leasing alternatives.

This program and the actions we take under it will apply to leasing and development actions on public land managed by the Bureau of Land Management.

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The actions may affect other values and uses of the same lands. The Department, through the Bureau, is charged with the difficult task of assessing resource use conflicts and ways of resolving them under provisions of the Federal Land Policy and Management Act (FLPMA), the National Environmental Policy Act of 1969, and a variety of other legislation and Executive Orders focused on protection of specific values and resources, such as threatened and endangered wildlife species. FLPMA requires the preparation of land use plans as a basis for major public land management decisions. The land use planning processes provide the means for assuring that oil shale development will reflect full consideration of other uses and values, and for facilitating coordination with plans of other Federal agencies, State and local governments, and other interests. Full public participation, of course, is required by law in the land use planning processes.

This planning process, through plan amendments, also will provide for timely action which will avoid delays in orderly development while still assuring analysis of multiple use impacts. I assure you that other impacted values will be considered in oil shale leasing and development decisions, and that there will be full compliance with the National Environmental Policy Act of 1969, including preparation of a programmatic environmental impact statement.

These are our objectives. However, to accomplish these objectives, a number of changes in our current oil shale leasing authority are necessary. For this reason, the Department proposed the amendments to Section 21 of the Mineral Leasing Act of 1920 that are contained in S. 3050.

With that background and indication of our plans for the future, I would like to describe S. 3050 in some detail and explain why we believe its enactment is of such great importance in enabling us to strengthen the Prototype Program and lay a foundation for the permanent oil shale leasing program.

First, S. 3050 would give the Secretary flexibility to issue an oil shale lease for an area larger than 5,120 acres—the maximum acreage now permitted in current law—where it is shown that a larger area is necessary to permit long-term commercial operations. In the long run, this new more flexible approach would ensure that lease tracts are of sufficient size to encourage economic development and efficient recovery of oil shale resources. It is also our view that enactment of this provision this Congress is absolutely essential to enable us to carry out the extended Prototype Program I have described to you. I have told you that it is our policy to disperse these leases as widely as possible. However, in the absence of authority to issue leases larger than 5,120 acres, it is almost certain we will receive nominations beginning January 15, 1981, only in Colorado, and we will be able to select tracts only in Colorado. This important consideration applies to both prototype and permanent leasing. Without this additional acreage authority, we do not expect we will receive serious nominations in Utah or Wyoming this January, or be able to lease in Utah and Wyoming to test technologies that, due to markedly different resource conditions, may differ substantially from those suitable in Colorado. Both Utah and Wyoming contain substantial oil shale resources, but the thickness of the pay zone and the quality of these resources would not generally provide sufficient recoverable oil shale to make development of a lease tract of only 5,120 acres economically feasible. For this same reason, the Department has already unitized the two existing oil shale leases in Utah. Because of the higher quality of the resource in Colorado, we do not anticipate it will be necessary or justified to use this provision for Colorado tracts very much, if at all.

If we are not able to lease in Wyoming and Utah, then any additional prototype leasing will likely be totally concentrated in Colorado. This would also unnecessarily concentrate environmental and socioeconomic impacts. We strongly wish to avoid this prospect and we also want to gain experience in the other two States with different resource conditions. I, therefore, urge you to consider this provision as being the most necessary and most immediately needed change in our legislative authority.

Second, S. 3050 would remove the current limitation of one oil shale lease per person, association or corporation. It is our own conviction that this limitation will seriously inhibit technological development, because it reduces interest in prototype leasing and encourages use of the most conservative methods which are known to be profitable by those who hold prototype leases. If it is not promptly modified, the success of our January call for nominations and additional Prototype Program lease offerings could be severely threatened. Even though we may see some variety in the technologies used, they will probably not be truly innovative if this provision is not adopted.

Approximately 80 percent of the oil shale resource in the Green River formation is found on Federal lands. Development of oil shale technology is extremely expensive and carries a very high degree of risk. With the current limitation of just one lease per company, it is unlikely that a company which receives a prototype lease will be able to apply the benefits of its research and development efforts to additional Federal oil shale resources until its initial lease expires. Interest in prototype lease offerings could be dampened considerably, if not lost entirely, if any company which heavily invests in pioneering oil shale technology

cannot later reap the commercial benefits of its work through acquisition of another lease in the same area. We believe that the single lease limitation is certain to have this undesirable effect. We believe that raising this limit will serve to increase competition and participation in the Department's oil shale leasing program.

However, to prevent monopolistic practices, we believe that the total number of leases held by any single company in a State and nationwide should continue to be limited. For these reasons we have recommended that the current limitation of one Federal lease be modified to provide only up to two leases in any one State and up to four leases nationwide.

For added flexibility, S. 3050 provides that when the resource on any lease is within 10 years of being depleted, the lessee may qualify for an additional lease. We believe this provision not only will permit economies of scale to be achieved in production with resulting economies in the price of final oil products, but also will help control and even out the cyclical nature of development effects, particularly on the small communities in the area that must contend with the potentially significant impacts of development.

The proposal would also provide that any leases issued in order to avoid bypassing small acreages of Federal oil shale resources, which could not otherwise be mined economically, would not be included in the limitations on oil shale lease ownership.

Third, S. 3050 would confirm and simplify the Secretary's existing authority to issue multi-mineral leases. We believe that an amendment clarifying our authority to issue multi-mineral leases is critical to the Prototype Leasing Program. Substantial quantities of saline minerals are associated with Piceance Creek Basin oil shale resources. Nahcolite holds great promise as a scrubbing agent in air pollution control equipment and dawsonite is a possible source of aluminum. While some of these minerals are bedded and could be avoided in the extraction of the shale, others occur in small pockets or are finely disseminated in the shale and will be removed with any development of the shale. Although nahcolite and halite can be separated before retorting, dawsonite can only be separated during retorting and only with certain retorting technologies. Thus, any decisions to recover dawsonite from shale must be made at the same time as decisions are made on the choice of shale retorting technologies.

Although the Department holds that it has the authority to lease the saline minerals along with the oil shale, the General Accounting Office has questioned this authority. In order to test multi-mineral technology and its environmental acceptability, and to prevent these other minerals from being left behind and wasted, the Department plans to issue at least one prototype lease that provides for multi-mineral development. If our authority to issue leases for multi-mineral development remains open to question, any such lease offering may be ignored or the winning bidder and the Department may be subject to litigation over the development rights the Department was authorized to award with parties asserting the GAO position. Enactment of S. 3050 would remove all question and allow us to proceed with multi-mineral leasing with assurance.

Finally, S. 3050 would authorize the Secretary to issue to any person, association or corporation holding an oil shale lease issued prior to 1985, which would only include those leases issued within the Prototype Oil Shale Leasing Program, an additional lease or leases for disposal of waste shale and for siting facilities off the original lease area to facilitate the development of oil shale operations on leased lands. This provision is similar to S. 2858. However, there are several differences. Under S. 3050 the benefits of this authority would be available to any holder of an oil shale lease issued prior to 1985; under S. 2858 they would be available only to persons currently holding leases under the existing Prototype Program. S. 2858's provision would aid only 4 specific lessees, at most, only 1 of which would be likely to immediately benefit from this relief. Moreover, such a limitation would prevent the Department from offering new leases for use with any technology that would require the use of additional land.

Under S. 3050, the oil shale lessee would have to demonstrate that the additional lease is necessary and appropriate for its operations. Such leases would be subject to a variety of criteria and other safeguards. For example, no lease could be issued until the Secretary has considered the environmental and other resource values, and other possible uses of the lands, and has made a determination that the public interest would be served by issuing that lease or leases. The Secretary would also require detailed reclamation plans for such areas. A lease issued under S. 3050 would be issued only for such period of time as the Secretary determines is necessary for the purposes of the lease, would contain such provisions as are needed for proper protection of environmental and other resource values,

and would require the lessee to pay the fair market value for the lease. Provisions are also included to allow mineral leasing, for example, for oil and gas, if compatible, on the lands covered by the additional lease, to restrict transfer of these additional leases, and to allow inclusion of lands under any other agency's jurisdiction, with consent of that agency and subject to conditions imposed by that agency.

We note that S. 2858, while similar to S. 3050, regarding this provision, includes several additional requirements that are not in S. 3050. It would require the Secretary to consult with the Governor of the State in which the lands are located before granting an "off-site" lease and would specify certain requirements that must be met to achieve proper environmental protection. We believe these provisions would be useful, and would, therefore, support amending S. 3050 to include them.

It is our view that providing for such "off-site" leases for the holders of pre-1985 oil shale leases would permit the most efficient mining of oil shale resources, especially in the richest areas, since mining tracts would no longer have to accommodate the processing facilities and spent shale, as well as the development operation itself. As I said before, we have limited the availability of such leases to those who hold leases issued prior to 1985, which will include all of the leases issued under the Prototype Program. If, on the basis of the Prototype Program experience, it is determined that further authority is needed, we will seek such authority for leases issued during and after 1985.

In closing, we are pleased that both bills we have reviewed contain an off-site leasing provision, but we firmly believe the failure to enact the other provisions contained in S. 3050 this year will seriously impair our ability to successfully complete the Prototype Oil Shale Leasing Program and may well delay development of a permanent leasing program. Even though the one new authority included in S. 2858 is immediately helpful from the standpoint of one lessee, the three other provisions I have discussed are critically important to the Administration and to the numerous companies that we believe will be interested in nominating new prototype lease tracts in January. We, therefore, strongly urge favorable consideration of these provisions so that the Congress can enact them this year. A delay in your favorable consideration will, we believe, lead to a continuation of the mixed successes of the Prototype Leasing Program and to delays in permanent leasing.

This concludes my prepared remarks. I will be happy to answer your questions.

Senator FORD. The next witness is J. Blaine Miller, president of Rio Blanco Oil Shale Co., Denver, Colo.

STATEMENT OF J. BLAINE MILLER, PRESIDENT, RIO BLANCO OIL SHALE CO., DENVER, COLO., ACCOMPANIED BY T. W. EYCK, VICE PRESIDENT, COMMUNITY, GOVERNMENT AND PUBLIC AFFAIRS

Mr. MILLER. Mr. Chairman, my name is J. Blaine Miller. I am president of the Rio Blanco Oil Shale Co. which is a general partnership of Gulf Oil Corp. and Standard Oil Co. of Indiana.

I appear before you today to present Rio Blanco's testimony on S. 2858 which is a bill to amend section 21 of the Mineral Leasing Act.

Senator FORD. If you want to highlight your statement, we will include it all in the record, or if you would like to read it, whichever you prefer to do.

Mr. MILLER. I will be happy to.

Senator FORD. Your testimony then will be included in the record, and you may highlight it.

Mr. MILLER. All right, sir.

Rio Blanco does support S. 2858 as introduced by Senator Gary Hart and cosponsored by Senator William Armstrong of Colorado.

As you know, a similar measure, H.R. 7941, has been the subject of hearings before the House Interior and Insular Affairs Committee and has been favorably reported to the House by that committee.

The administration has within the past 6 weeks recommended the adoption of a more comprehensive legislative measure which would grant the Secretary the authority contained in the Hart and Armstrong bill as well as make other changes in the oil shale leasing program.

While we support the more comprehensive legislation proposed by the Department, the limited concerns addressed in S. 2858 are far more critical to our project.

Based upon the Department of the Interior's testimony before the House committee on July 31, 1980, it is my understanding that both the House bill and S. 2858 have the support of the administration. There are several documents that are a part of my written testimony, and as I understand, these will be entered into the record.

Senator FORD. They certainly will.

Mr. MILLER. All of these documents express varying degrees of support for oil shale development or address the need for the use of off tract land. They also address some of the concerns and qualifications.

Mr. Chairman, the prototype leasing program was designed by the Department of the Interior to test many different retorting, mining and retorting technologies. Tract C-a, the tract that was leased by Rio Blanco Oil Shale Co., was selected by the Department of the Interior as a probable test of the open pit mining and surface retorting extraction method.

The desirability of such a test is the fact that where appropriate, resource recovery from an open pit mine and surface retorting far exceeds the potential recovery from any other alternate extraction

method, and illustrative of this is the fact that under our tract, tract C-a, we have approximately 9 billion barrels of shale oil in place. We estimate that with an open pit mine and surface retorting, we can recover 5 billion barrels, with the modified in situ technology, approximately 2 billion barrels, and with room and pillar mining and surface retorting, approximately 1 billion barrels.

The differential is tremendous, and this resource recovery differential is one of the main reasons why tract C-a commanded a bonus bid of $210 million as compared to, for example, the other Colorado Federal prototype tract, C-b, which commanded a bonus bid of $117 million, even though the in-place reserves are approximately the same, so it is this open pit potential for tract C-a that accounts for a large part of the differential in the bonus bid commanded by those two leases.

Off tract land for plantsiting and process shale disposal are essential for an open pit mine to be a viable option to us. It simply is no longer viable if we do not have off tract land.

Before our lease was issued, the Department of the Interior believed that, as we did, off tract land could be made available to us through the special land use permit route. This was alluded to several times in the EIS, and there are several quotes from the EIS in our formal testimony.

After the lease was issued effective March 1, 1974, the solicitor for the Department of the Interior concluded that this authority did not exist. The Secretary did not have the authority to grant this land with a special land use permit, and the Department of the Interior sponsored bills in both Houses of Congress. Hearings were held in the House or in the Senate, but neither of these bills ever got out of committee.

Without the off tract land, the open pit was no longer an option to us, and consequently we reexamined other extraction method potentials and concluded that the modified in situ method had some advantages and we shifted our attention to the modified in situ extraction scheme.

We are currently about 2½ years into a 4-year modified in situ technology development program. This program started out as about a $93 million program, and has since escalated to our current estimates are for $140 million.

To date, Rio Blanco has invested, including lease bonus payments, about $250 million in our tract. Our modified in situ technology development program involves the burning of three in situ or in-place retorts of progressively larger size. The first of these is scheduled for ignition at the end of this month, and the last should complete burning toward the end of 1981.

In our modified in situ extraction method we bring about 40 percent of the volume of the retort to the surface to create an initial void for the blasting of the remainder of the material. The efficiency requires that this be processed on the surface. In fact, with the higher recovery anticipated from surface retorts, we expect to get about equal volume from the 40 percent of the material brought to the surface as we do from the 60 percent that would be retorted in place.

Senator FORD. Is that 40 percent of the total area?

Mr. MILLER. No, sir. It is 40 percent of the volume of the retort; 40 percent is brought to the surface. Then the remaining 70 percent is expanded explosively into the 100 percent, so you wind up with a retort that has about 40-percent process where initially it had virtually none.

Senator FORD. And this is the 40 percent you want to find an offsite disposal area, is that it?

Mr. MILLER. We are going down a dual course which I will get to in a moment. At the present time, our economics appear to be about awash as between modified in situ and open pit mining and surface retort, and if that remains the case, then the thrust is to go to an open pit mine and surface retorting because the resource recovery is two to four times as great.

Senator FORD. What is the cost? In relation to the cost then if it is greater, then it reduces the cost, increases the profit?

Mr. MILLER. I'm sorry, sir?

Senator FORD. Your recovery is you say two to four times greater from the open pit mining?

Mr. MILLER. With open pit mining and surface retorting, we estimate 5 billion barrels recovery from our tract.

Senator FORD. The other route, it would be two to three?

Mr. MILLER. With modified in situ, about 2 billion, and with room and pillar mining and surface retorting, about 1 billion.

Senator FORD. Go ahead.

Mr. MILLER. Because an efficient surface retort is needed to supplement our modified in situ program and is critical to any alternate extraction method that requires that all of the material be retorted on the surface, we have agreed with the Lurgi Co. of Germany to demonstrate 4,400 tons a day with a Lurgi surface retort demonstration module on land adjacent to our tract.

We anticipate starting construction on that in the early part of May of next year, and anticipate that unit being on stream by the second half or the first half of 1983, preferably in the first part of the first half of 1983.

We are designing a small open pit in the northwest corner of our tract to supply the ore to that unit. As I have mentioned just a moment ago, our current economics show that the modified in situ and the open pit surface retorting, the economics are about awash, and if that remains the case, then obviously we will move toward an open pit where the recovery is significantly greater.

Because of this, we are continuing with our commercial planning for an open pit and surface retorting, and our intent is that as we gain some hard information, then we will select the most efficient of these methods for commercialization and by most efficient I mean when we consider the economics, the environmental concerns and the technology, all three of those things weigh evenly, but we cannot begin to design seriously a commercial open pit surface retorting plant until we know where that plant is going to be.

Obviously also you cannot apply for a permit for a plant that isn't site specific. We believe that a major requirement for logical commercial planning of the emerging oil shale industry is to grant the Secretary the authority, the Secretary of the Interior the authority to permit utilization of off tract lands for disposal and

surface facility siting. This is true of our modified in situ plan and would in our view be critical for the open pit mining method.

We intend to continue our demonstration programs to develop detailed information on various extraction processes for commercialization, and we will continue to actively pursue engineering design and commercial planning for both the modified in situ and the open pit approaches.

The Government should recognize, however, that our ability to move forward with plans for siting, for permanent disposal, for engineering and design, and for major equipment investments are hampered by uncertainty. Our studies to date demonstrate the resource conservation, economic efficiency, and enhanced environmental protection would be best served by granting authority to utilize off tract lands for disposal and plantsiting.

Today, however, we cannot proceed to the level of detailed engineering and design for commercialization because we do not know whether to design for off tract or on tract siting and disposal. We are convinced that authority to use off tract lands for disposal and plant siting is necessary for full demonstration of the role that our domestic oil shale reserves can play in America's energy future. We believe this issue is important and that this uncertainty should be resolved in this session of Congress.

We believe that S. 2858 gives the Secretary enough discretion to make the surface of public lands available if he determines that doing so is in the public interest and the requirements of the act are met.

We are very enthusiastic about doing our part to make shale oil available to the consuming public at the earliest possible time, and we urge this committee to report favorably on S. 2858.

I will be happy to try to answer any questions that you might have, Mr. Chairman.

Senator FORD. All right, Mr. Miller. On the second page of your statement you give resource recovery figures in your testimony based on the assumption of offsite disposal.

Mr. MILLER. Yes, sir.

Senator FORD. What would the three figures be without the offsite land?

Mr. MILLER. With open pit mining and surface retorting, it would be zero. It simply is not a viable option to consider.

With modified in situ, that would be reduced by at least 20 to 35 percent because of the requirement for plantsiting, so you could not put in situ, modified in situ retorts under a plant with the blasting and all that is required. It simply would not be possible. The plantsite would take up to 35 percent of the tract. The remainder of the tract then would have to be used for process shale disposal, and while those reserves would be recoverable, it would be a considerable additional expense.

The room and pillar probably would not change much, if any.

Senator FORD. It would be basically the same?

Mr. MILLER. Yes, sir.

Senator FORD. We are trying to get some figures here to compare what you just said. Am I correct that you need about 20 percent for disposal land?

Mr. MILLER. No, sir.

Senator FORD. For modified in situ?

Mr. MILLER. No, sir. That is for plantsiting, for the siting of surface retorts, for crushing and grinding, for oil handling and things like that.

Senator FORD. You need 20 percent. That is 20 percent you need?

Mr. MILLER. Yes.

Senator FORD. Twenty acres, I'm sorry.

Mr. MILLER. No, sir. I didn't mention 20 acres.

Senator FORD. For one above ground retort, 20 acres? You went through three pretty quick and I am trying to get all my thoughts together. I am not an engineer. I am not going underground to see what the hell you are doing either. What I have got to get is what I get up here. I have been in one coal mine, went down 3 miles. That's enough for this old boy.

Mr. MILLER. What I thought I was responding to was your question without off tract mining.

Senator FORD. That is correct.

Mr. MILLER. What would those three recoverable numbers be, and my answer was that open pit mining would be zero because it is simply not a viable option.

With modified in situ, about 20 percent of the tract, 20 to 30 percent of the tract would be required for plantsiting, that is, for the location of surface retorts, for crushing and grinding, for administration buildings, for oil handling facilities, and you would not be able to exploit the resource under those facilities, so that part would be lost.

The remainder of the tract could be exploited by modified in situ extraction methods, but at considerable additional cost.

In the room and pillar, probably it would not change a great deal. There would be a question there whether you would be able to exploit the resource under a plantsite, and you might have to forgo that area as well.

Senator FORD. Your modified in situ, we get to the 76,000-barrel-per-day operation?

Mr. MILLER. Yes, sir.

Senator FORD. It is my understanding that you would need 150 acres for the above ground retort?

Mr. MILLER. Seventy-six thousand-barrel-per-day rate?

Senator FORD. A hundred and fifty; using the modified in situ process, you would need 150 acres. You don't know where that figure came from?

Mr. MILLER. No, sir. Our best estimates are that at a commercial scale—and the 76,000 barrels a day is, of course, the number that appears in our detailed development plan.

Senator FORD. That's where I got it.

Mr. MILLER. Yes, sir; at that rate, our best estimate, well, at the maximum rate our resource would sustain, our best estimate is that we would require about 1,500 acres for plantsiting, crushing, grinding, the whole requirement, and about 5,000 something in that order for process shale disposal, and the reason I am not real definite on this is that the need for processed shale disposal is only for that period of time until the pit gets large enough so that you can backfill in one corner while you are excavating in the other, and then the pit just marches across the tract like that.

We would, of course, backfill at the earliest possible time both from an environmental and from an economics standpoint.

Senator FORD. In discussing this yesterday in preparation for today, it was my understanding that the 1,500 acres was for the open pit operation.

Mr. MILLER. The requirement is not a great deal different, not a great difference in the two schemes. The modified in situ, the requirement might be a little bit less, but not a great deal.

Senator FORD. But you say basically they are the same?

Mr. MILLER. With the modified in situ, you are only processing 40 percent as much material on the surface, so I guess we could say that in all probability the requirement for plantsiting in the case of modified in situ should be about 40 percent of what it is with an open pit scheme, but the reason—I am not trying to be evasive.

Senator FORD. You keep driving me around the outfield. I don't know whether I am playing left field or right field.

Mr. MILLER. It is not intentional.

Senator FORD. I know. I understand, but we were trying our best, I was trying to get all these figures and everything in my own perspective, and then we get information from our folks yesterday that we thought we had it on balance. We understood 1,500 acres for the open pit. Now you say they are both about the same, but yet 40 percent of 1,500 is about 600 acres. That's twice as much as I thought they told us yesterday that would be needed to modify in situ.

Mr. MILLER. The reason I can't provide you with an exact number is that we have not yet designed a commercial-scale operation. That's one of the programs that we are currently involved in.

Senator FORD. What you are really saying is you can't tell us what the amount would be from resource recovery as it relates to that because you haven't designed it yet? You are just making a guess?

Mr. MILLER. As to the number of acres of off tract land that would be required for a plantsite?

Senator FORD. Oil shale recoverable through modified in situ with and without disposal land offsite.

Mr. MILLER. Yes, sir. I think the numbers that I gave you are about as accurate as we can come up with.

Senator FORD. You gave me two numbers. You gave me 1,500 acres which you said we thought was for open pit, and then you said your information for modified in situ is about the same, but then you say 40 percent of that would be necessary. Maybe it is 40 percent of the recoverables. I am not sure that we got it all together; 40 percent of 1,500 acres is 600 acres.

Mr. MILLER. We have not designed a commercial-scale operation in any detail.

Senator FORD. Then you really can't tell me what is necessary?

Mr. MILLER. Not accurately, no, sir.

Senator FORD. What you are telling me is an educated guess based on your experience and background and so forth?

Mr. MILLER. Yes, sir.

Senator FORD. Let me ask you this question. At several points in your statement you make the point that Interior contemplated open pit and offsite disposal for tract C-a.

Mr. MILLER. Yes. It was specifically referred to.

Senator FORD. You stated that the Department of the Interior thought it could use its special land use authority to issue offsite leases?

Mr. MILLER. Yes, sir.

Senator FORD. Yet the Department of the Interior Solicitor responsible for this area testified 4 years ago before this committee that his office discarded that belief after a Supreme Court decision on the Alaskan pipeline 10 months before the lease sale.

Mr. MILLER. He may have made that decision, sir, but it was not recorded. In the EIS there are numerous statements, in fact, one is quoted in my testimony, in the EIS of 1973, offsite disposal overburden of spent shale might take place on Federal, State, or private lands. Permission to use Federal lands for disposal would require a special land use permit issued by the Secretary of the Interior.

Senator FORD. Well, 10 months before the lease was consummated, as I understand it, in the statement by Mr. Ferguson in 1976 before this committee, Mr. Ferguson said, "It certainly was discarded in the solicitor's office if it had been held there when we came to the conclusion on the Alaskan case because the Alaskan case, as you have pointed out, is very similar to this case."

That is testimony by the Solicitor of the Department of the Interior.

Senator WALLOP. If you would yield, Mr. Chairman?

Senator FORD. I'll give it all to you.

Senator WALLOP. I would just say that the Solicitor's opinions are frequently designed to take care of internal department policy and not necessarily very fundamentally grounded in the law.

Senator FORD. This was a Supreme Court case as it related to the Alaskan oil pipeline.

Senator WALLOP. I know, but we have had the recent Solicitor for land and water resources who made a number of water statements which he has backed off on, both of which he claimed foundation in the Supreme Court decisions, and both of which other legal minds thought that he had stretched it.

Senator FORD. I am not here to argue whether the Solicitor was right or wrong. The only thing I am saying is that we have testimony 10 months before this lease was made that they had discarded it and it was no longer in use. Now that is all that I am going on. Whether he is right or wrong is a case for the courts and some lawyers to make some money off of.

Senator WALLOP. The other thing is we do seem to be able to create that.

Senator FORD. Oh, we do a good job. I may go back to school.

Senator WALLOP. Of course, the other thing is that one would hope that people within the Department who prepare EIS's would listen and coordinate their thinking with those of the Solicitor if they are going to follow the Solicitor's opinion ultimately because you can't have one hand in the Department saying that you can't do this and the other hand in the Department saying you can, and the Department taking no action to resolve the two hands.

Senator FORD. Do you have some questions?

Senator WALLOP. No, sir. I just hope that we can resolve it because I know we have to get underway, whether we have to do it by this piece of legislation or whether they already have the authority.

Senator FORD. Let's get back to Secretary Joseph's proposal, I guess it is S. 3050, the administration's proposal. Rather than just to limit his testimony to S. 2858 he also supported some items in S. 3050.

How do you feel it relates to whether you give them more acres in Wyoming than you do in Colorado and the limitation of the leases as it relates to any one State or nationally?

Mr. MILLER. I think the fact that the two Wyoming tracts received no bids indicates that there is something wrong. I think it would be very difficult. In your conversation you were talking about Senator Hart's recommended qualifications of 150 feet of resource. I believe it was greater than 25 gallons per ton?

Senator FORD. I think that produced 25 gallons per ton; that was a description of the quality of 150 feet.

Mr. MILLER. The problem there is that 150 feet of resource with 25 gallons per ton at the surface is worth a great deal more than 150 feet, 1,000 feet of overburden, so you would have to be very careful I think in putting those restrictions on there; 150 feet very near the surface could be open pitable and very economical; 150 feet with 1,000 feet of overburden, the chances of that being economical would be very slim. There are many, many things that must be considered.

Senator FORD. How much flexibility do you want the Secretary to have or should the Congress give him in making a judgment about leases?

Mr. MILLER. Where that discretion resides I am not real sure I am prepared to recommend to Congress, but there should be some discretion that relates to the quality of the resource and the potential economics of that resource because they vary tremendously, and as I pointed out in my testimony on tract C–a and C–b, they are only 19 miles apart and have approximately equal resource. Under the C–b tract the resource is thicker, but it is more spread-out. Under our tract, it is a little bit thinner, but richer over a greater proportion of the interval, but the fact that our tract commanded 210 million versus 117 for C–b is mainly because of the open pit potential, and the fact that we can recover 5 billion barrels from an open bit scheme where with the other methods your resource recovery is far less.

Senator FORD. What all should the Secretary, in your judgment, take into consideration when he makes a judgment on how many acres and so forth that would be available in a lease?

Mr. MILLER. There would be many things, and I am sure I would in enumerating them forget some.

Senator FORD. We'll make this a matter of record that I am not going to hold you to it and go back and say you said so and so.

Mr. MILLER. One of the important things would be the overall thickness of the resource. The next thing would be within that overall thickness, how much of that material is continuous high-grade material. In other words, looking at 25 gallons a ton or more,

a tract that had 150 foot contiguous would be far more valuable than a tract that had that same resource but spread out in 10-foot intervals. That would be another consideration.

The overall grade, the average grade through the resource would be another consideration; the amount of overburden over the resource would be another important consideration.

The water, whether you have ground water and to what extent, that is very troublesome in almost any extraction method that you want to employ. I'm sure there are others, but those are the main ones.

Senator FORD. Those seem to be the biggest ones in my mind. Water becomes a very definite problem, doesn't it?

Mr. MILLER. Yes, sir, not the availability of water, but the fact that you have a great deal of water to deal with in your process.

Senator FORD. In the ground?

Mr. MILLER. Yes, sir. Under tract C-a we have two major underground aquifers that produce quite a bit and cost a great deal of money to dispose of, to dry up the area and dispose of that water.

Senator FORD. Is that water usable?

Mr. MILLER. We are currently dealing with a demonstration program that we are involved with now which only deals with the upper aquifer, and the quality of that water is better than the water that would flow past our tract in intermittent stages. None of the streams, few of the streams out there are continuously running, but the streams that go past our tract, the water from that aquifer would be superior in quality to that. It would be adequate for stock watering and that sort of thing, irrigation, but it is not potable.

Senator FORD. It would be adequate for irrigation?

Mr. MILLER. Yes, sir.

Senator FORD. That sounds like it is pretty adequate to me.

Senator WALLOP. Sounds good.

Mr. MILLER. At the present time we are reinjecting all of that water into the same aquifer that we are pumping it out of, but in a commercial scheme that would not be a viable option.

Senator WALLOP. Why would it not be a viable option in a commercial scheme? Would the other option be better or you are saying it would not be?

Mr. MILLER. It doesn't make any sense to to me. In the first place, you are in a semidesert area. The area out there gets about 14 inches of rain a year, and to take a commodity as valuable as water and bring it to the surface where it is usable and then turn around and pump it back down——

Senator WALLOP. I was just thinking that is it economically not viable or is it economically just more sensible to proceed to use it?

Mr. MILLER. A little bit of both, but on a small operation you can sustain some recycle. We are pumping it out of wells in the mine. and then one-half mile, 2 miles away we are pumping it back into the same reservoir, and obviously we are getting some recycle there. You can tolerate that on a short-term, small-scale basis, but on a long-term, big-scale basis that would just——

Senator WALLOP. Do some damage to the resource?

Mr. MILLER. Well, no, I don't think it would do that, but it would be very, very costly and accomplish absolutely nothing. It would

just be a total waste of funds, and as I say, when you bring that very valuable resource to the surface where it can be used for irrigation and other purposes, it doesn't make a lot of sense.

Senator WALLOP. I would agree with you. There is always somebody around that has an impractical scheme for a practical commodity.

Mr. MILLER. Yes. To a large extent you know the feeling is you can't improve on nature, and if that water was put down in this reservoir, that's where it ought to stay.

Senator FORD. What do you do with the water in a commercial venture then, just pump it into the river, make it a continuous flowing stream?

Mr. MILLER. There are many, many options and we have not arrived at a complete plan for that. One option would be to take a stream, a slip stream from that total stream, and purify that to a very pure state and recombine the two to allow them to be discharged.

The other is to do some purification work on the total stream. A great deal of it would be used in spent shale moisturization. We have options on 41,000 acre feet of water from the Rocky Mountain Power Co. from White River, and our intention is that any water rights that we would damage by discharging this water on the surface, that those would be augmented from these water rights that we have from the White River, but there are numerous different potential ways of handling the problem, and we are looking at all of them, and we will just select the best one.

Senator FORD. How far away are you from a commercial operation if you were on the go today?

Mr. MILLER. Our plan is to start up a first phase, a first increment of commercial production in 1987, and as I say, our DDP, detailed development plan, that has been approved by the Department of the Interior, calls for 76,000 barrels a day. That is for a modified, combined modified in situ and Lurgi surface retort program, with an open pit surface retorting. It might be a little bit more or less than that, probably a little bit less.

We would anticipate the first increment being about 50,000 barrels a day in startup in the early part of 1987.

Senator FORD. You couldn't move any faster?

Mr. MILLER. That's a pretty fast track, optimistic program. I don't think we could move a great deal faster without some waste involved. We are spending about $5 million a month at that tract at the present time. That rate will go up when we start construction on the Lurgi unit. Say we have $250 million invested at the present time, another $45 million in our modified in situ program, and $135 million on the Lurgi demonstration module, and of course, we are spending a considerable amount of money in-house in our commercial planning for the open pit surface retorting program as well, so we have a great deal going on, and our intention is to carry these two courses down parallel and select the most efficient for commercialization, and optimistically to have that first increment of commercial production in place by early 1987.

Senator FORD. So your judgment from your testimony is that the open pit probably will be the most economical and the largest recovery?

Mr. MILLER. Without a doubt the greatest resource recovery by, as I say, two to four times. The economics at the present time are——

Senator FORD. Basically the same, but the recovery is so much larger?

Mr. MILLER. Yes, sir.

Senator FORD. How many average feet of overburden would you take off in order to get to the shale in an open pit operation.

Mr. MILLER. Average over our tract is 450 feet. It varies from 80 feet on the western side of the tract to about 850 feet on the northeast corner of the tract. Average is 450 for a resource of about 1,200 feet, so our stripping ratio or the ratio of overburden to resource is quite attractive.

Senator FORD. That seam, if I could use that term, does it just quit or does it—I am talking about if you have got a seam of coal. That's what I am familiar with. It is 50 inches. We think that's a hell of a seam in our part of the country. In Senator Wallop's country maybe 150 feet would be just a small seam, but at some point it quits.

Now will your shale do the same thing?

Mr. MILLER. Oh, it does eventually, but it is throughout the basin.

Senator FORD. I understand that. You can go forever if you follow the seam, but I am talking about the width of the seam. Is it 10,000 feet? It is bedded over many miles?

Mr. MILLER. Yes, sir; a 100 miles.

Mr. EYCK. Seventeen thousand square miles.

Mr. MILLER. In three basins—the Waski Basin, a basin in Colorado; the Picea Basin.

Senator FORD. I am trying to get in my own mind—from pictures and designs of the open pit and placing the overburden, it seems to me that you want the pit and a place for the overburden, and when you get the pit to a point where you start to refill it, you bring that back in? Is that basically the way you operate it?

Mr. MILLER. Yes, sir. We would at the earliest possible time backfill in one corner of the pit and excavate in the other, and just let that pit move across the tract.

Senator FORD. How do you propose stacking the overburden? This is the land we are trying to get to, but how do you propose eliminating the overburden until you are able to start backfilling or whatever?

Mr. MILLER. The topsoil would be stored, of course, for revegetation purposes, and this would be brought up in lifts, I don't even recall how many feet, but in 4 or 5 feet, something in that order, and then contoured, and it could be contoured to resemble the current terrain or whatever, but it would be designed so that you wouldn't have to wait until the entire area, the entire spent shale had been disposed of for revegetation. The revegetation would be progressive.

Senator FORD. You plan on permanently dumping?

Mr. MILLER. Yes; sir, but once that open pit had moved across our tract, then if we leased an adjacent tract or it was leased to someone else, that open pit could serve the same purpose for that

tract as an initial disposal site, and that pit could just keep on moving.

Senator FORD. You just need one original disposal site?

Mr. MILLER. Yes, sir, so long as you keep the pit the same size; if you envision something two or three times that size, then you might require additional disposal, but for a pit the size that we are contemplating on our tract, that could just move right on across and in the Picea Basin, there is an area——

Senator FORD. When I looked at that I was very concerned about trying to pronounce it, but with my southern English anything is likely to come out.

Mr. MILLER. There is an area adjacent to our tract on the east and then it curves around. It is commonly referred to as the Golden Horse Shoe, and this is an area where the resource is thick, rich, with not too much overburden and is generally accepted as amenable to open pit mining, and that contains approximately 100 billion barrels of recoverable oil from shale.

You get beyond that area and your overburden is too great or the resource is too thin to make it amenable to open pit mining at the present time. Now, if technology develops, it can change that.

Senator FORD. I have no further questions.

Senator WALLOP. I just have one. Isn't it true that the remainder of the tailings after excavation are substantially larger in volume than what you remove initially?

Mr. MILLER. It depends a bit on the method that is used, but yes, sir, there is some swell factor.

Senator WALLOP. In essence you would hope that your pit would get slightly larger as you went along, wouldn't you?

Mr. MILLER. Yes; you would have to dispose initially of enough spent shale so that that bit would remain large enough to accommodate backfilling and excavating at the same time.

Senator WALLOP. Is there anything that could be done with that kind of shale?

Mr. MILLER. There are all sorts of potentials. For example, in the Lurgi process it is possible to raise the temperature in the retort to the point where the carbonates are producing a cement, and that is one of the things we are looking at.

In the modified in situ scheme there is the potential for slurrying the spent shale from the Lurgi retort, pumping it back into the burned out in situ retorts, and potentially even making the old retorts new pillars and the old pillar new retorts and essentially doubling the area coverage of your modified in situ program.

Senator WALLOP. It sounds pretty exciting to me.

Senator FORD. For 1987—I have no further questions.

Mr. MILLER. The one thing I might explain to you, you were asking about the extent of these seams as you referred to them in the basins.

In the central part of the basin, the oil shale is about 2,000 feet is about the maximum thickness. On the edges of the basin that thins out to 150 feet, something like that, and eventually outcrops and thins to zero.

The portion that is on the edge of the basin, this 150 feet thick, goes completely across the entire basin and the center part is just like a dish. The center part was deposited first. It was not deposit-

ed on the edges, and this basin just gets bigger and bigger, so in the center part it has got very thick, 2,000 feet, and on the edges about 150 feet thick, but that thing is by nondeposition.

Senator FORD. This is the view, which is a very small view. This is basically what you are saying. That is what I was trying to figure out. It appears here that it ends at a given point.

Mr. MILLER. It does. If you draw parallel lines across there, and say that is a period of deposition, you put in 10 feet, it would be just in the center of the basin. Another 10 feet, it would extend a little further out, another 10 feet, further out, and finally the last deposition would go completely across the basin.

Senator FORD. I thank you, Mr. Miller.

Mr. MILLER. Thank you.

[The prepared statement of Mr. Miller and subsequent information follows:]

SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES
SEPTEMBER 9, 1980
RIO BLANCO OIL SHALE COMPANY

Mr. Chairman, Members of the Committee:

My name is Blaine Miller. I am President of the Rio Blanco Oil Shale Company, a general partnership of Gulf Oil Corporation and Standard Oil Company (Indiana). I appear today to present Rio Blanco's testimony on S.2858, a bill to amend Section 21 of the Mineral Leasing Act.

Mr. Chairman, The Rio Blanco Oil Shale Company supports S.2858 as introduced by Senator Gary Hart and co-sponsored by Senator William Armstrong of Colorado. The major purpose of S.2858 is to authorize the Secretary of the Interior to lease the surface estate of additional Federal lands for disposal, plant siting and other uses needed in connection with the development of a Federal lease under the government's Prototype Oil Shale Leasing Program.

A similar measure, H.R. 7941, has been the subject of hearings before the House Interior and Insular Affairs Committee and has been favorably reported to the House by that Committee. The Administration has within the past six weeks recommended the adoption of a more comprehensive legislative measure which would grant the Secretary the authority contained in the Hart-Armstrong bill as well as make other changes in the oil shale leasing program. While we support the more comprehensive legislation proposed by the Department, the limited concerns addressed in S.2858 are far more critical to our project. Based upon the Department of the Interior's testimony before the House Committee on July 31, 1980, it is my understanding that both the House bill and S.2858 have the support of the Administration.

Today, I would like to briefly review for the Subcommittee the status of our project, and explain the Rio Blanco oil shale project's need for additional off-tract land. Also, because they are relevant to the Subcommittee's consideration of S.2858, I would like to submit for the record as part of my testimony the following documents:

(1) Senate Joint Resolution No. 18 of the General Assembly of the State of Colorado urging the passage of Federal legislation authorizing "surface only" uses on Federal lands for resource recovery systems.

(2) A letter to Mr. Guy Martin, Assistant Secretary of the Interior for Land and Water, from Mr. Monte Pascoe, Executive Director of the Colorado Department of Natural Resources, expressing support for such legislation with certain qualifications.

(3) A letter from Department of the Interior Under Secretary James Joseph to the Secretary, the Solicitor, Assistant Secretaries and Deputy Under Secretary explaining his position on additional Federal oil shale leases and stating support for legislation to solve the problems of insufficient land for siting of process facilities and disposal of waste.

(4) A letter from Mr. Terry L. Thoem, Director of the Energy Policy Coordination Office of Region Eight of the Environmental Protection Agency to Mr. Don Smith of U.S. Senator Gary Hart's Office comparing projected environmental effects of open pit mining and surface retorting versus modified in situ mining and processing.

All of these materials express varying degrees of support for oil shale development or address the need for the use of off-tract land. Some of the primary concerns and qualifications are also reviewed.

Gulf and Standard leased Oil Shale Tract C-a in Rio Blanco County, Colorado in 1974 under the Federal Prototype Oil Shale Leasing Program. Under this competitive lease program the owners of Rio Blanco successfully bid a bonus payment of $210 million, $126 million of which was paid in cash to the Federal government. Developmental activities on the tract are subject to the terms and limitations of a comprehensive lease agreement. The tract is 5,100 acres and contains total oil shale reserves equivalent to about nine billion barrels.

We estimate that two to five billion barrels of shale oil could be economically recovered and produced from the tract depending on the mining method used, the location of the retort facilities and the location of the disposal area for initial storage of spent shale and overburden. Assuming off-tract use of some adjacent lands, open pit mining would permit recovery of five billion barrels; modified in situ would permit recovery of about two billion barrels; and underground room and pillar mining would permit recovery of about 1.0 billion barrels.

As we have pointed out in earlier testimony, Tract C-a was selected as an open pit and surface retorting test by the Department of the Interior. This is evidenced in numerous places in the environmental impact statement released by the department in 1973. It was also clear in the EIS that off-tract disposal was believed to be necessary for efficient development of the reserves.

Rio Blanco pursued open pit-surface processing development plans for Tract C-a after conducting studies and comparing that approach with underground room and pillar and with modified in situ methods. At that time, it was apparent that maximizing resource recovery as well as economical and technological considerations, favored the open pit approach. Open pit mining enhanced resource recovery of the oil shale on the lease tract by two to four times the other available methods.

Further studies conducted by Rio Blanco defined how an open pit mine could be developed in accordance with applicable environmental requirements. It was apparent that backfilling of the pit with overburden and spent shale could not begin without disrupting on-going mining activities until after the mine had operated a number of years and a substantial area for backfill had been developed.

Disposal of overburden and processed shale on the surface of Tract C-a--rather than off-site as was initially contemplated by Rio Blanco's owners and the Department of the Interior--was also examined. This method,

however, would require very expensive rehandling of large volumes of material as mining progressed. Further, on-tract disposal would also limit our ability to fully utilize underground mining and modified in situ technology. Upon completion of our studies of Tract C-a we finalized and submitted to the Department of the Interior a detailed development plan for open pit mining and surface retorting utilizing off-tract lands for plant siting and for disposal.

After we acquired the lease and had undertaken substantial engineering and design work on Tract C-a the Solicitor of the Interior Department considered the question of authority for offsite uses. The Solicitor concluded during the summer of 1975 that the Secretary of the Interior does not have the authority to grant the use of additional federal lands for surface uses such as disposal of spent shale and the siting of processing facilities. Mention of the acquisition of off-tract land had been made in a number of Department of the Interior documents, including the EIS in Volume III, Chapter III, page 15:

> "Offsite disposal of overburden or spent shale might take place on Federal, state, or private lands. Permission to use Federal lands for disposal would require a Special Land Use Permit, issued by the Secretary of the Interior."

The Solicitor concluded that Special Land Use Permits cannot be used for off-site waste disposal and that the Secretary lacks authority to grant such use. Subsequently, the Administration, on September 12, 1975, submitted draft legislation to the Congress to grant the required authority to the Secretary and recommended its enactment. Hearings on this legislation were held before this Committee's predecessor, the Senate Interior and Insular Affair Committee, on March 19, 1976. No further action was taken on the bill during the 94th Congress.

Since the use of off-tract land could not be acquired absent new legislative authority, open pit development of Tract C-a seemed very unlikely to Rio Blanco management. Also, air quality monitoring in the area had shown occasional violations of primary and secondary ambient air quality standards. Since this was occurring without any industry in the area, Rio Blanco concluded that an oil shale facility could not be built.

In July of 1976, Rio Blanco requested a two-year suspension of operations from the Secretary of the Interior, under Section 39 of the Mineral Leasing Act. A one-year suspension was approved and was in effect from September 1, 1976 to September 1, 1977.

During the suspension, the Environmental Protection Agency reinterpreted their positions on the air quality problems so that they no longer prohibited at least some development. The off-tract land situation did not improve, however, and Rio Blanco reevaluated other available technologies, including underground room and pillar and modified in situ. At the time, these investigations indicated that the modified in situ method had potential and we shifted our emphasis to this technology.

In May of 1977, we submitted a revised Detailed Development Plan based on modified in situ technology.

Today, we are involved in a demonstration program to prove the feasibility of the modified in situ technology. We plan to construct and burn three underground retorts by the end of 1981. The program is funded by our parent companies at a cost of $140 million which includes $84 million of offsets to the $210 million bonus payment to the Department of the Interior. Although we expect some delays and surprises, preparations for our modified in situ demonstration program have gone well to this point. We plan to initiate the burn of the first retort by the end of this month or early next month.

Because we remove about 40% of the oil shale contained in the in situ chamber, we plan to retort this material at the surface. We have therefore entered into an agreement with the Lurgi Company to demonstrate a Lurgi-Ruhrgas surface retort. The first phase of that agreement is now underway. We believe it will lead to the construction and operation of a 4,400-ton-per-day demonstration retort which would be capable of producing about 2,000 barrels of shale oil per day.

At present, we plan to build the Lurgi demonstration retort on some 450 acres of land owned by the State of Colorado north of the tract. We recently entered into an agreement with the State for the use of this land. The agreement provides for the eventual transfer of title from the State to Rio Blanco. While this site will suffice for the demonstration facility, it will be inadequate for anything larger.

We will also have to use this land for disposal of processed shale and overburden from the demonstration retort. These uses and the necessary crushing and related equipment will effectively employ nearly all of this additional land. In order to supply sufficient oil shale to test the retort, we plan to develop an open pit mine on Tract C-a for the necessary two to three years.

The total cost for our Lurgi program, which will take four to five years, is in the neighborhood of $135 million. This is in addition to the lease costs and those for the modified in situ demonstration program. At this point, all of these funds are being supplied by our parent companies without Federal assistance.

The passage of S.2858 would give the Secretary of the Interior the authority to lease additional off-tract land adjacent to the Colorado land. This would then allow Rio Blanco the opportunity to obtain off-tract land and integrate the demonstration module into a commercial plant of several Lurgi units. Without off-tract land, the commercial plant site alone would require 25 to 30% of the surface of the tract, precluding the recovery of the resource beneath it, a penalty in resource recovery we believe to be excessive.

With the enactment of this legislation, and if everything goes on schedule we could be ready for initial commercial capacity of about 50,000 barrels per day by 1987. As we see it now, that would be the earliest possible date.

With that background and brief update on our operations, I would like to point out why, more than ever, we encourage the timely passage of S.2858.

We are convinced that surface retorting of oil shale will be needed regardless of the success of the modified in situ technology. If the technology proves successful, the oil shale mined in excavating the retort chambers must still be brought to the surface and processed in surface retorts. If the modified in situ technology falls short, surface retorting would be essential for any other mining method.

Rio Blanco believes that a major requirement for logical commercial planning of the emerging oil shale industry is to grant the Secretary the authority to permit utilization of off-tract lands for disposal and surface facility siting. This is true of our modified in situ plan and would, in our view, be critical for the open pit mining method. We intend to continue our demonstration programs to develop detailed information on various extraction processes for commercialization. We will continue to actively pursue engineering design and commercial planning for both the modified in situ and open pit approaches.

The government should recognize, however, that our ability to move forward with plans for siting, for permanent disposal, for engineering and design, and for major equipment investments are hampered by uncertainty. Our studies to date demonstrate that resource conservation, economics efficiency and enhanced environmental protection would be best served by granting authority to utilize off-tract lands for disposal and plant siting. Today, however, we cannot proceed to the level of detailed engineering and design for commercialization because we do not know whether to design for off-tract or on-tract siting and disposal.

We are convinced that authority to use off-tract land for disposal and plant siting is necessary for full demonstration of the role our domestic oil shale reserves can play in America's energy future. We believe this issue is important and that this uncertainty should be resolved in this session of the Congress.

We believe that S.2858 gives the Secretary sufficient discretion to make the surface of public lands available if he determines that doing so is in the public interest and the requirements of the Act are met. We are very enthusiastic about doing our part to make shale oil available to the consuming public at the earliest possible time. We urge your Committee to report favorably on S.2858.

I would be glad, Mr. Chairman, to answer any questions the Committee may have and to provide any further information you may require.

Thank you.

LDO NO. 80 0790/1

Second Regular Session

Fifty-second General Assembly

STATE OF COLORADO

AGRICULTURE, NATURAL RESOURCES

BY SENATORS Bishop, Anderson, Noble, Soash, Hughes, Hatcher, McCormick, Shore, Clark, Schaefer, Yost, and H. Fowler; also REPRESENTATIVE Theos.

SENATE JOINT RESOLUTION NO. 18

URGING THE PASSAGE OF FEDERAL LEGISLATION AUTHORIZING "SURFACE ONLY" USES ON FEDERAL LANDS FOR RESOURCE RECOVERY SYSTEMS.

WHEREAS, The President of the United States and the Congress of the United States have called for accelerating the rate of development of alternative energy sources; and

WHEREAS, The national dependence on imported oil has reached an alarming percentage of our total petroleum requirements; and

WHEREAS, The supply of imported petroleum is becoming increasingly unreliable and costly; and

WHEREAS, The enormous oil shale resources in Colorado and Utah afford the most likely opportunity for shale oil to become a significant alternative source of energy; and

WHEREAS, The ability to provide for offsite location of plant sites, processed shale disposal, and other oil shale facilities can enhance efficient resource recovery and sound environmental planning and is in the public interest; and

WHEREAS, In order to become more energy self-sufficient and have the ability to produce adequate supplies of petroleum products for our nation, it is essential that the nation's industries be authorized by the Congress of the United States to employ the most efficient technological resource recovery systems available; now, therefore,

Be It Resolved by the Senate of the Fifty-second General Assembly of the State of Colorado, the House of Representatives concurring herein:

That we, the members of the Fifty-second General Assembly of the State of Colorado, do urge the members of the Congress of the United States from the state of Colorado and Utah and

Capital letters indicate new material to be added to existing statute.
Dashes through the words indicate deletions from existing statute.

pages tightly bound

the Governors of Colorado and Utah to support the passage of federal legislation to permit the Secretary of the Department of the Interior to grant "surface only" uses on federal lands to serve as oil shale plant sites or areas for the disposal of overburden and processed shale, and other special uses.

Be It Further Resolved, That copies of this Resolution be sent to the President of the Senate and the Speaker of the House of Representatives of the Congress of the United States and to each member of the Congress of the United States from the states of Colorado and Utah, to the Governors of the states of Colorado and Utah, and to the Secretary of the Department of Interior.

[illegible], Executive Director
1313 Sherman St., Room 718, Denver, Colorado 80203 839-3311

Division of Parks & Outdoor Recre
Division of Water Resources
Division of Wildlife
Geological Survey
Oil and Gas Conservation Commis
Soil Conservation Board
Water Conservation Board
Mined Land Reclamation

May 6, 1980

Mr. Guy Martin
Assistant Secretary of
the Interior
Land and Water
Interior Building
Washington, D. C. 20242

Dear Guy:

I understand that Interior is planning to make a decision in the next few days concerning the use by lessees under the prototype oil shale program of off-tract lands for the disposal of spent shale and for the location of oil shale processing facilities.

The State of Colorado will not object to legislation authorizing the Department of Interior to Permit such uses under the following conditions:

- Permission to use off-tract lands should be contingent on a finding by the Secretary that such action is environmentally and economically sound and in the public interest;
- Before making this finding, the Secretary should consult with the Governor of the affected state;
- Specific off-tract sites should be chosen to minimize negative impacts on such things as socio-economic conditions, wildlife, agriculture, transportation, recreation, energy conservation, and other areas that will be considered in an environmental assessment prepared pursuant to CEQ regulations;
- The developer should pay a fair amount for the use of off-tract lands. This amount should reflect both the value of the surface and also the opportunity cost of restricting access to minerals; and
- The stipulations and terms of the prototype leases should be applied to off-tract lands, with certain changes: strong stipulations should be included concerning the mitigation of socio-economic impacts; it should not be possible to take development costs as a credit against payments for use of federal lands; and environmental stipulations should be re-examined.

In addition, development of the off-tract lands is subject to state and local laws and ordinances. For example, an entity such as Rio Blanco Oil Shale would be required to obtain a special use permit or a conditional use permit from the county for activities on an off-tract site, as was done for activities on Tract Ca, if the county deems this appropriate. The developer would also have to apply for or amend a variety of state permits, including a mined land reclamation permit.

Sincerely,

D. Monte Pascoe
Executive Director

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

Memorandum

To: Secretary
Solicitor
Assistant Secretaries
Deputy Under Secretary

From: Under Secretary

Subject: Decisions on the Oil Shale Secretarial Issue Document

On May 20, 1980, I conducted a decision meeting on the Oil Shale Secretarial Issue Document, attended by the Solicitor-designate, Assistant Secretaries Martin and Davenport, Deputy Assistant Secretary Ross, Acting Assistant Secretary Mills, Steve Freudenthal, Steve Quarles, and others. I would like to thank all who participated for the lively and thorough discussion of the issues presented in the SID. In response to the President's program to accelerate the development of a synthetic fuels industry and in full consideration of the potential and problems associated with the development of oil shale resources on the public lands, I have reached the following decisions regarding federal leasing for oil shale development:

I have chosen options A-2, B-2 and B-2.3, a combination of C-1 and C-2, E-2, E-3, F-2, F-3, F-4, G, H-3, and I-2, with the alterations and additional guidance provided below.

Additional Leasing Under the Prototype Program

The Department will lease up to four new tracts under the Prototype Program. Assistant Secretary Martin, after consulting with Assistant Secretary Davenport, should submit to me within two weeks the proposed organization and members of a task force to recommend the number and possible location of leases which might be offered, the technologies which should be encouraged through new lease sales, and, more generally, how best to accomplish the additional leasing. The proposal should describe how the Area Oil Shale Supervisor, the Oil Shale Environmental Advisory Panel, the affected States and local governments, the industry, and environmentalists will participate in the work of the task force or otherwise make their views known to the task force. The proposal should also contain a three month schedule for completion of this initial step.

Figures compiled by each of three Federal agencies—this Department, the Department of Energy, and the Environmental Protection Agency—suggest that the President's 1990 goal of 400,000 BBL/day production of oil shale may be met from facilities on private lands, Federal research projects, and existing prototype lease tracts. Those projections, however, are based on several favorable assumptions. By modest additional leasing under the Prototype Program, we can both provide a measure of insurance against the failure of one or more of those assumptions to occur and foster additional production in the early 1990's during the transition to a permanent leasing program.

My decision to call for additional leasing under the Prototype Program, however, is not based solely or primarily on a need to give immediate encouragement to additional oil shale production. Of equal or greater importance is the need to strengthen the Prototype Program. I would characterize the Program's record to date as one of only qualified success. It has provided us, and without additional leasing, could continue to provide us, with supervisory experience and technical and environmental information on only one technology in only one area of the oil shale region. Additional leasing under the Program will permit us to gain the valuable broader experience first sought in the Program when the six lease tracts were selected and offered in 1974.

Accordingly, the recommendations of the task force must be consonant with the purposes of the Prototype Program. The tract or tracts ultimately chosen to be leased must be designed and located so as to provide us with the broader experience envisioned under the Program. The task force should review the technologies presently being employed or proposed to be employed in the existing prototype leases and all other oil shale projects and recommend which technologies should be encouraged in the additional leasing. The tract or tracts to be offered for sale should be delineated so as to invite bids from those companies that plan to use the technology or technologies which I decide, on the basis of the task force's recommendations, should be encouraged within the limited new prototype leasing. Although I do not wish to constrain lease bidders or lessees with lease terms which stipulate the technology to be employed, I would like the task force to recommend to me other techniques, in addition to delineation of tracts on resource bases suitable for particular technologies, which would encourage companies to thoroughly consider use of targeted technologies. On the basis of the SID, I can stipulate at this time that from among the up to four tracts which may be leased, at least one will be delineated to encourage multi-mineral development. For this technology only, I will consider, on the basis of task force recommendations, the use of lease stipulations which will require multi-mineral development.

For two purposes—reducing adverse environmental and socioeconomic impacts, and providing supervisory and operating experience with recovery methods under different conditions—tracts to be offered for lease should not be sited in a concentrated manner.

Permanent Leasing Program

Although I have determined that modest renewed leasing under the Prototype Program is sufficient at this time to encourage additional experience in, and production from, oil shale development, I believe that we must not permit the

President's 1990 production goal to become frozen for subsequent years. For the health of a maturing industry and the energy security of the Nation, oil shale production should continue to expand in the 1990's and beyond. As the largest and richest portions of the resource are in Federal ownership, increased production beyond 1990 will be largely dependent on further leasing. As leasing with the primary objective of achieving additional production is not fully consonant with the several purposes of the Prototype Program, leasing to meet production objectives beyond 1990 should be conducted not under the Program but instead under a comprehensive, permanent leasing program.

Development of a new permanent program will permit the full scrutiny and analysis required for such a significant initiative. Preparation of a permanent leasing program must begin immediately. It should include the following:

1. a review of the Prototype Program;

2. an extensive program of consultation with the affected States and local governments, industry, the environmental community, and other interested members of the public;

3. consideration of a full range of leasing alternatives (including the alternatives of no further leasing and no near term leasing); and

4. full compliance with the National Environmental Policy Act of 1969, including preparation of a programmatic environmental impact statement.

The constantly changing national and international outlook for liquid hydrocarbons requires that a permanent leasing program be developed and put in place within the next two years. Failure to immediately initiate development of a permanent program poses the distinct risk that an emergency situation in the future would require the quick development and implementation of a poorly designed, crash leasing program, without adequate safeguards.

Assistant Secretary Martin should conduct the review of the Prototype Program and report its results to me in 4 months. Within 3 weeks, I would like to receive a plan for the review, recommendations on how best to proceed with the program development effort, and, if the task force concerned with additional prototype leasing is not assigned this responsibility, a list of those who will participate in the review, including those parties previously mentioned in relation to the task force.

Exchanges

I have decided not to give special emphasis to the execution of exchanges. The Department is obligated to fully consider each exchange application we receive as expeditiously as possible, and we intend to fulfill this obligation. However, the Department will place the greater priority in personnel and funding on additional leasing under the Prototype Program and preparations for development of a permanent program. Exchanges simply fail too many tests as a desirable resource management tool. As we cannot condition exchanges of fee title, as we do leases, with diligent development and information sharing requirements, we cannot be at all confident we are either

assuring greater production within any given period or increasing our knowledge of oil shale opportunities or issues. We may be doing nothing more than increasing companies' reserve bases without committing the firms to oil shale development. We would obtain no revenues from the selected tracts in the form of bonuses, rents or royalties. Furthermore, the affected States and local governments would not receive shared Federal mineral revenues from selected tracts as they would from leased tracts. By emphasizing exchanges, the Federal government would be less able to disperse oil shale development and influence its timing and State and local governments would have fewer funds with which to mitigate adverse environmental and socioeconomic impacts, thus increasing the potential intensity of those impacts.

Most important, however, no matter how much effort is made in streamlining exchange procedures, they are a highly inefficient and costly method of placing Federal resources in the hands of private developers. Too many times the Federal government does not receive in exchange leasable or immediately leasable tracts. In those instances, the Government must analyze at least two tracts to assist the development of one. Several recent proposals for exchanges of both oil shale and coal lands have involved the offer to exchange several small parcels for one large Federal tract. These exchanges would require the analysis of numerous tracts in order to make one tract available for development. A similar effort, applied to leasing, could place several more tracts in the same development position. For these reasons, while we will fulfill our obligation to consider exchange applications, we will concentrate our resources on leasing rather than exchanges.

Existing Acreage Constraints

Present statutory acreage limitations could seriously limit our ability to conduct additional leasing under the Prototype Program. First, the 5,120 acre limitation prevents the leasing of tracts of a sufficient size to mine economically by themselves in many areas of the oil shale region. Second, as we possess no authority to permit off-lease siting of processing facilities or disposal of spent shale, even within the richest areas the tract size limitation may prevent the most efficient mining of tracts which must accommodate not only the mining but also the processing facility and the spent shale. Finally, the limitation of one tract per state for each company may serve as a disincentive to early entry of firms in oil shale development. Firms may wish to avoid prototype leases, learn from prototype lessees' experiences, and lease later under a permanent program where they can develop their single lease tract in each state to its fullest commercial potential.

We will seek legislation which would remove all three constraints by providing the Department with authority to designate each lease tract of a size sufficient to sustain long-term commercial operations on the oil shale resource base within the tract, to issue permits to lessees for fair market value to provide for the off-lease disposal of shale and siting of processing facilities, and to permit a firm to hold a maximum of four leases nationwide and two leases per state, with an additional lease per state if the company is producing on the first two leases within that state and is within 10 years of completing production on one of them.

To eliminate the impression that conclusions may have already been reached about the specifics of a permanent program, our legislative proposal should limit the application of the two off-lease authorities to leases already issued and to be issued under the Prototype Program. If these authorities are determined to be necessary for a permanent program during subsequent permanent program development efforts, amendments could then be proposed to make those authorities applicable to all oil shale leasing under section 21 of the Mineral Leasing Act. As the need for a larger acreage for certain lease tracts has already been conclusively demonstrated and as the removal of the one lease per state limitation from all future leasing is necessary now in order to encourage the most active possible interest in renewed prototype leasing, we will propose that the larger-acreage and more-leases-per-state authorities not be limited to Prototype Program leases and, instead, be made applicable immediately to all section 21 oil shale leasing.

Additional Multiple Mineral Leasing Authority

The Solicitor has determined that the Department possesses authority under existing law to lease lands for multi-mineral development. Because some have questioned our authority and because we will propose legislation to eliminate acreage constraints, there is no reason not to seek confirmation of our existing authority in that legislation. As we do possess the authority for multi-mineral leasing, we should proceed with the decision to lease at least one multi-mineral tract in the renewed prototype leasing irrespective of whether the proposed legislation has been enacted.

Mining Claims

On the issue of settlement of the oil shale mining claims disputes, I adopt the uniform recommendation of the Departmental offices that no decision be made whether to seek to settle the oil shale mining claims cases until after the Supreme Court has ruled in Shell Oil v. Andrus, the oil shale mining claims discovery standard case. It is not in the public interest to seek settlement at the present time. The pending resolution of that case might wholly moot any settlement negotiations, or any agreed upon settlement that required legislative authority to consumate. Even if the Supreme Court does not rule on the case in a wholly dispositive manner (i.e., even if it rules on Congressional ratification but not on estoppel against the United States), its decision will require significant if not total adjustment of any strategy for settlement or any concessions made prior to the decision in negotiations for settling these disputes.

This decision responds to the order of the U.S. District Court for the District of Colorado in The Oil Shale Corp. v. Andrus, issued August 30, 1979, and answers the settlement proposals thus far made and discussed in response to that Order. I have seriously considered both the Order and the settlement proposals and conclude that it is not in the Department's or the public's interest to seek settlement now.

I reserve the opportunity, of course, to reopen this decision, and wholly reconsider the question, after the Department has examined the Supreme Court's decision and what it portends for prompt resolution of the disputes between the Department and the oil shale mining claimants.

Non-Leasing Methods of Obtaining Performance Information

Assistant Secretaries Martin and Davenport should seek to expand our information exchanges with other Federal, State and local government agencies and the industry. Memoranda of Understanding and other formal documents should be prepared as necessary, but no additional legislative authority will be sought.

/s/ Jack Horton

UNDER SECRETARY

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Environmental Protection
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Colorado, Montana,
North Dakota,
South Dakota,
Utah, Wyoming

EPA

May 1, 1980

Ref: 8EA

Mr. Don Smith
Office of Senator Gary Hart
United States Senate
Washington, DC 20510

Dear Don:

Following my conversations with you and Steve Saunders regarding the issue of open pit mining/surface retorting vs in-situ environmental impacts, I thought it would be helpful to put my thoughts on paper.

We have indicated that there may be net positive environmental benefits associated with open pit/surface retorting. It should be pointed out that this is a very preliminary conclusion based upon very little supporting hard facts. The basis for this net positive advantage rests on 1) the ability to isolate and contain solid waste, 2) the apparent better potential sulfur emissions control, and 3) improved resource recovery.

A simplified summary matrix is provided below...

	Open pit/surface retorting	in-situ
Air Quality	+ (SO_2)	+ (PM and NO_x)
Solid Waste/leachate	+	
Water Quantity		+
Aesthetics		+
Wildlife	Even	Even
Resource Recovery	+	
Socio Economic		+

A summary comparison is provided on a number of areas below.

Air Quality

- Improved sulfur emissions control appears possible with surface retorting. Oxy in-situ technology indicates SO_2 levels about 2 to 3 times higher than can be achieved with surface retorting. The reason being more CO_2 and higher reduced sulfur concentrations.

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2.

- Higher particulate emissions from surface mining and retorting. Although higher, they are probably controllable within limits. Our predictions at Flat Tops show that when the SO_2 increment is 100% consumed the particulate increment is only about 40 percent consumed.

- NO_x emissions from surface retorting are much higher than from MIS. Some of aht NO_x shown below results from upgrading.

- A summary of pollutant pounds per barrel of oil produced is provided below.

	SO_2	PM	NO_x
Colony	0.164	0.134	0.903
C-b (est)	0.376	0.056	0.248

- Polycyclic organic material (PON) and other trace element(Hg,As, and Cd) emissions will occur from either process. We do not have adequate data to make conclusions. This area needs attention by ORD.

Solid Waste

- Open pit mining will create significant amounts of overburden to be disposed. Depths of about 1500 ft. of material may cause difficult restoration.

- The advantage to surface retorting rests with the ability to isolate the processed shale from potential leachates entering ground. It has not been demonstrated that spent in-situ retorts can be isolated.

Water Quantity

- Water consumption would be higher for open pit mining/surface retorting by about a factor of 2.

Water Quality

- Other than the leachate question the water effluent question is probably an even trade. There may be an advantage to surface retorting due to better controlled conditions.

Aesthetics

- An open pit operation is definitely not pleasing. The prospect of 20 to 30 years operation prior to mine back filling, coupled with the potential of creating a "mound" and a "lake" is a definite disadvantage to open pit.

Wildlife

- There will be more acres disturbed for open pit but the acres per barrel of oil are probably an even trade due to the much better resource recovery.

Resource Recovery

- Rio Blanco estimates open pit/surface retorting recovers about 5 billion barrels vs. 2-3 billion with in situ.

Socio-Economic

- The number of people required for an open pit/surface retorting operation is higher than for in-situ.

I hope these thoughts are helpful. I am also enclosing copies of a paper EPA recently presented at the Colorado School of Mines symposium which discusses the Flat Tops PSD increment issue. If you have questions please call.

Sincerely,

Terry L. Thoem

Terry L. Thoem, Director
Energy Policy Coordination Office

Status of EPA Regulatory and Research Activities Affecting Oil Shale Development

T. Thom, E. Bates, C. Dial, E. Harris and F. Princiotta
U.S. Environmental Protection Agency

ABSTRACT

The Environmental Protection Agency and the respective State Departments of Health are involved in a joint partnership with shared responsibilities for protecting the environment during the development of the oil shale resource. Legislation in the form of the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Safe Drinking Water Act, and the Toxic Substances Control Act provide the framework for EPA's regulatory responsibilities. The current status of implementing regulations and agency policies vis-a-vis these Acts is provided in this paper. Also, important aspects of Colorado, Utah, and Wyoming environmental regulations are provided.

Key activities of EPA's oil shale environmental research program are discussed. Of special note is the completion of a document entitled "Environmental Perspective on the Emerging Oil Shale Industry". This document is the first of a series which will communicate EPA regulatory policies, state of knowledge of oil shale environmental impacts, and will provide EPA's environmental control technology expectations.

EPA's efforts to plan, design, and implement a comprehensive synthetic fuels research and regulatory strategy are also described. The policy level Alternative Fuels Group has been charged with the development of this strategy for oil shale, coal gasification, coal liquefaction and ethanol.

INTRODUCTION

EPA has legislative mandates to protect air and water quality, to insure a safe drinking water supply, and to provide for an environment conducive for the enjoyment of man on this earth. In order to accomplish these goals, EPA is involved in a partnership with State and local environmental agencies in the planning, implementation and enforcement of legislation and regulations. EPA and the State environmental agencies recognize that environmental considerations play a role in the determination of answers to the question of oil shale - how much? and when?

This paper will 1) highlight the EPA environmental regulatory requirements for the oil shale industry, 2) discuss EPA's key oil shale research activities, 3) describe EPA's new organization strategy aimed at the design and implementation of a comprehensive regulatory and research strategy for synthetic fules, 4) pose environmental questions regarding oil shale development which remain unanswered.

REGULATORY ACTIVITIES

EPA is responsible for various regulatory activities which affect the construction and operation of oil shale facilities. Enabling legislation and implementing regulations in the form of the Clean Air Act Amendments of 1977 (P.L. 95-95), the Clean Water Act Amendments of 1977 (P.L. 95-217), and Safe Drinking Water Act of 1974 (P.L. 93-523), the Resource Conservation and Recovery Act (RCRA) of 1976 (P.L.94-580), the Toxic Substances Control Act (TSCA) of 1976 (P.L. 94-469), and to a lesser extent the Noise Control Act of 1972 (P.L.92-574) establish the regulatory framework through which EPA operates. Of course, the National Environmental Policy Act of 1969, (P.L. 91-190) is also a significant environmental legislative authority. (Figure 1)

Papers presented by EPA at the 11th and 12th Oil Shale Symposiums have described in some detail the requirements of these Acts and their

implementing regulations. No major revisions to our basic legislation have occurred in the past year. This paper will discuss changes to regulations over the past year. Lawsuits, litigation, and court decisions have played a major role in reshaping some of our regulatory programs.

Perhaps of most interest at the present time to the oil shale industry is the EPA promulgation of RCRA regulations. Partial fulfillment of a court order occurred with the promulgation of regulations satisfying Parts 3002, 3003, and 3010 on February 26, 1980. Criteria for defining a hazardous waste (3001) and general performance standards for the treatment, storage and disposal of a hazardous waste will be promulgated by April 30, 1980. These performance standards will be based upon a concept of Best Engineering Judgement (BEJ), as defined by the permit writer on a case-by-case basis. The BEJ concept is consistent with Best Available Control Technology (BACT),Best Available Technology (BAT),and Best Management Practices (BMP) concepts for air and water.

TSCA requirements have been an issue and concern to oil shale interests in the past. In June of 1979 EPA published its inventory of existing chemicals. Shale oils are included in the inventory. A review of the appropriateness of including shale oil in this inventory is presently underway. If shale oil remains on the list, developers are exempt from the testing requirements of pre-market notification. The action would not exempt developers from future EPA enforcement actions. If the manufacture and use of a chemical are found to cause substantial endangerment to human health, options available to EPA include ban of manufacture, restrictions on transport and/or use, and precautionary labeling. The Act also provides a backup for other EPA legislation for the control of toxic emissions and effluents.

The Alabama Power vs EPA decision changes some of EPA's Prevention of Significant Deterioration of Air Quality (PSD) regulations. Proposed regulations to satisfy the inital court ruling were published on September 5, 1979 and are due to be promulgated by June 2, 1980. Changes will include 1) the need for a BACT assessment for all pollutants regulated under the Act (Figure 2) except where controlled emissions will be below de minimis levels(Figure 3), 2) the requirement for an analyses of baseline air quality concentrations for all pollutants regulated under the Act, and 3) guidance on modelling, phased construction, and stack heights. The analyses for baseline pollutant concentrations may include one year of continuous monitoring. Alternatives would include either a showing that existing data (for NAAQS pollutants) collected at other locations were representative or modelling existing emissions (for non-NAAQS pollutants) in the area to estimate concentrations. Modelling guidance contained the opinion that air quality models are on the frontier of science but must be used. It should be noted that the opinion was rendered that if a PSD increment was initially judged not to be violated but was later found to be violated either through monitoring data or improvements in modelling techniques, the State Implementation Plan could/should be revised to require additional control.

EPA is involved in litigation regarding visibility regulations. Regulations were to have been promulgated by August 1979. Since they were not, FOE and EDF sought court relief. We are under court order to propose regulations

by May 15, 1980 and to promulgate by November 18, 1980. Based upon limited visibility analyses performed via PSD reviews on oil shale projects to date, visibility protection could provide additional constraints, beyond the Class I PSD increments, to the size of an industry.

The size of an oil shale industry appears to be limited by air quality Class I increments at the Flat Tops Wilderness Area. This concept has caused significant activity in the past year by both industry and government. Preliminary analyses indicate that development of 200,000 to 400,000 BPD could consume the increment. (Figures 4 and 5). Several oil shale developers considered rushing in to get their share of the increment. This has not occurred. EPA has recognized that a Regional Complex Terrain Model applicable for oil shale country must be developed. A "planning accuracy" model will be developed by Summer 1980. Also, the design of a two year field data gathering effort followed by model development or refinement has been initiated. It is our goal to have a useable Regional model for use in permitting decisions by 1982. Joint funding between government and industry is being sought.

The review of PSD permit applications is establishing a better emissions data base than previously available. To date PSD permits have been issued for five oil shale projects. Figure 6 shows permitted emissions rates on a per barrel of oil produced for four of the permits. The fifth permit was for a research-type operation. Given the concern over consumption of the PSD increments it is safe to conclude that these permitted limits should provide an upper benchmark for future applications. In order to provide a comparison between a Synfuels facility and a conventional fossil fuel plant, Figure 7, compares the Colony emissions rate to a conventional 1000 Mwe coal fired power plant meeting New Source Performance Standards (NSPS). These facilities are comparable on an energy basis of coal input and oil output.

Underground injection control regulations will be promulgated in April 1980. In-situ oil shale facilities are treated as Class III wells. This classification requires proper disposal and monitoring requirements. Wells must be properly cased, injection fluids characterized, and groundwater quality monitored.

The salinity litigation involving EPA and EDF was ruled in favor of EPA in Fall 1979. Thus, the Colorado River Basin Forum plan and standards at three locations on the Colorado remain intact. Colorado is reviewing all of their water quality standards and stream classifications. Of special interest to oil shale developers has been the proposed classification of Piceance Creek as a cold water fishery. This designation would impose extremely stringent limits on any potential discharges.

Several other regulatory policy/procedure issues are addressed in the EPA "Perspectives" document which will be discussed later. These include 1) PSD increment consumption, 2) NAAQS policies, 3) air modelling responsibilities, 4) future Wilderness areas, 5) PSD monitoring, 6) permit bases - BACT, BMP, and costs, 7) permit lifetimes, 8) consolidated hearings, 9) completed application requirements, 10) permit enforcement procedures, 11) regulation certainty, 12) stream classifications, 13) salinity, 14) TSCA and 15) program delegations.

RESEARCH PROGRAM

EPA's Office of Research and Development has been reorganized and divided into the Office of Monitoring and Technical Support, Office of Environmental Engineering and Technology, Office of Environmental Processes and Effects Research and the Office of Health Research. All of these offices are actively involved in oil shale research with a collective budget of approximately $5 million in fiscal 1980.

Within EPA several separate laboratories conduct or contract oil shale-related environmental studies. The Office of Environmental Processes and Effects acts as coordinator for the Interagency Program. The Office of Environmental Engineering and Technology(OEET) has contracts work in the area of overall assessments and control technology. The Industrial Environmental Research Laboratory in Cincinnati(IERL-CI) funds and manages research on overall assessments, extraction and handling, processing and management and control of all pollutants. Research laboratories in Ada, Oklahoma; Athens, Georgia; Duluth, Minnesota; Las Vegas, Nevada; and Research Triangle Park, North Carolina conduct research studies in the processes and effects area. Shale oil product (end use) studies are managed and funded by both the Industrial Environmental Research Laboratory at Research Triangle Park (IERL-RTP) and Ann Arbor (Michigan) Emission Control Technology Division (ECTD) of the Office of Air, Noise and Radiation.

Specific objectives of the EPA Oil Shale Program are two-fold: first, the program is to support the regulatory goals of the Agency; second, the research is to be directed towards ensuring that any oil shale industry to be developed will be accomplished in the most environmentally acceptable manner that is reasonably possible. To these ends, EPA is continuing to assess the research needs and environmental concerns expressed by the Department of Energy (DOE) and the oil shale industry.

A budget breakdown and description of specific individual research projects is present in "Program Status Report - Oil Shale - 1980 Update" which is scheduled for public release in a few weeks. Therefore, a detailed discussion on ongoing research activities will be omitted in this paper.

The types of research projects include long term revegetation success of processed shale, raw and processed shale leaching experiments, residuals characterization at the Geokinetics project, characterization and treatibility studies of produced mine and retort water, characterization of the mineral composition of in situ spent shale, assessment of appropriate reduced sulfur controls, characterization and treatibility studies of retort offgas, visibility studies, development of groundwater monitoring strategies, development of appropriate surface water chemical and biological methods, and development of monitoring guidance.

Two key outputs of the research program involve the publication of oil shale guidance documents.

In the Fall of 1978, the Office of Research and Development of the Environmental Protection Agency began efforts to provide reference documents and guidance to EPA offices, federal and state agencies , industry and the public, on environmental issues related to oil shale. These documents are intended to assure that the development of a mature oil shale industry is not delayed by uncertainties while assuring that the industry develops in a manner which is compatible with national environmental goals.

The major thrust and accomplishments over the past year have included: the development of the document "Environmental Perspective on the Emerging Oil Shale Industry" which presents general information relevant to oil shale pollution problems and their control as they are viewed today; and the initiation of work on a pollution control technology guidance document which will discuss the applicability, performance and costs of pollution control alternatives available for the oil shale industry.

The first document became available in draft form in the Summer of 1979 under the title "Pollution Control Guidance for Oil Shale Development -Revised Draft Report." Following extensive review by EPA, other government agencies, the oil shale industry, and the environmental community, numerous changes were made including the title. This document now titled "Environmental Perspective on the Emerging Oil Shale Industry" is undergoing final review with public release expected in the Summer of 1980. This report, prepared by the EPA Oil Shale Research Group, will convey EPA's understanding and perspective of environmental aspects of oil shale development by providing a summation of available information on oil shale resources; a summary of major air, water, solid waste, health, and other environmental impacts; an analysis of potentially applicable pollution control technology; a guide for the sampling, analysis, and monitoring of emissions, effluents, and solid wastes from oil shale processes; suggestions for environmental goals, and a summary of major retorting processes, emissions and effluents.

EPA is now preparing a second document "Pollution Control Guidance for Oil Shale" with the first draft expected by the end of calendar year 1980. This document is being prepared by the EPA Oil Shale Work Group under direction provided by the Office of Environmental Engineering and Technology and the Industrial Environmental Research Laboratory, Cincinnati.

This document will present a critical and detailed analysis of pollution control alternatives for a commercial oil shale industry. The document will contain extensive information on the design, performance and cost of a wide variety of available environmental control technology options applicable to oil shale processing. Control options will be considered as they specifically apply to oil shale through the use of six case studies as a data base and reference point. The six case studies will cover the following active oil shale development projects all of which are expected to reach commercial operation by 1990:

TOSCO/Colony Development in Parachute Creek

Union Oil Development in Parachute Creek

White River Project at Ja.Ub using the Paraho Process

Superior Oil Multimineral Development

Occidental Development at Tract C-b

Rio Blanco Development at Tract C-b

Emphasis will also be placed on identifying important areas of uncertainty, and on specifying the assumptions made in the analysis.

The EPA envisions this document as the second of a series leading toward the eventual establishment of regulatory standards for the oil shale industry. The document is expected to serve several purposes. First, a comprehensive, state-of-the-art understanding of pollution control alternatives for oil shale using current knowledge will be established, supported by extensive data on design, performance and cost. Second, a comprehensive understanding of important areas of uncertainty in pollution control will be developed. Third,

the document will provide a basis for a high level of communication between the EPA, industry and the public on pollution control for oil shale. Finally, the document will serve as an important and updatable reference on oil shale pollution control.

It should be kept in mind that the present data base used in the development of the Pollution Control Guidance Document is incomplete, and only preliminary decisions can be made in evaluation pollution control options. The purpose is to provide a first cut, broad base of information which specifically addresses the pollution control problems faced by the oil shale industry. It is hoped that this will stimulate the proper concern and cooperation to assure that the industry develops in an environmentally acceptable fashion and is not delayed by uncertainties regarding environmental standards.

Extensive review by EPA's regulatory offices, Region VIII, other government agencies, industry, and public interest groups is planned prior to release of this document. Public distribution is scheduled for the Summer of 1981.

ALTERNATE FUELS GROUP

On January 18, 1980, EPA established a management structure designed to be responsive to the President's synthetic fuels and Energy Mobilization Board initiatives. Two policy groups, the Alternate Fuels Group and the Permits Coordination Group, will operate under the direction of the EMB Task Force. The Alternate Fuels Group will develop the Agency's regulatory and research strategy for synthetic fuels industries. Working groups within the AFG have been established for oil shale, direct coal liquefaction, indirect coal liquefaction and coal gasification, and ethanol from biomass. The AFG will coordinate preparation of environmental guidance for these emerging technologies for use by industry planners and permitting officials. The AFG will also recommend and oversee preparation and promulgation of control technology based standards for synthetic fuels facilities. The preparation of Pollution Control Guidance Documents (PCGD) will provide the first component of the basis for these standards. The first draft of the oil shale PCGD is scheduled for late 1980. Industry, government and the public will be asked to review and provide comment on the draft PCGD. Final publication is slated for Summer 1981. The second policy group, Permits Coordination Group, will provide national management of permitting mechanisms in order to respond effectively to demands for expediting permit decisions. The PCG will develop a system for tracking permits, establish project decision schedules for permit review, and assure that potential environmental and permitting problems are recognized early.

UNANSWERED ENVIRONMENTAL ISSUES

Mining and conversion of oil shale will degrade air quality, will consume precious water resources, may degrade surface and/or groundwater quality, will create solid and hazardous wastes to be disposed of properly, and will create significant population growth in a predominantly rural setting which translates into potential social and economic problems. That these things will occur is a given.. the question is the magnitude and the significance of the occurrence. Key questions such as the following exist:

1. How much ground water will be intercepted during mining?
2. What will the quality of potential discharge be?

3. Can groundwater quality be protected during and after in-situ retorting?
4. Can processed shale be disposed of properly without degrading ground or surface water quality?
5. Will revegetation of processed shale be successful over the long run?
6. What are the concentrations of various sulfur species in retort off gas streams and what is the best approach to control of these compounds?
7. What will be the air quality and visibility impacts on the Flat Tops Wilderness Area (nearest Class I area)?
8. What are the expected trace element concentrations in air, water, and solid waste residual streams?
9. Is conventional pollution control technology directly applicable to oil shale residuals? Is it effective?
10. What is the expected population growth associated with the development of an oil shale industry?

These questions may look familiar. They should be, since they are the same ones posed in our EPA presentation at the 12th Annual Oil Shale Symposium. The fact that they remain unanswered points out to us that the environment is not much closer to being ready for oil shale than it was a year ago.

Answers to the above questions (and perhaps other questions not yet posed) will in part determine the ability of individual plants and of an oil shale industry to be compatible with the desired environment for oil shale country.

Answers to some of the above questions may be partially answered by theoretical research work and limited-scope field investigations in the absence of any oil shale facilities. Answers to the remaining questions will necessarily be developed through rigorous testing programs and data analyses performed on facilities representative of commercial size. Reliable answers will be obtained only through a cooperative coordinated effort among government and industry.

CONCLUSION

Development of oil shale appears to be closer to reality than ever before. EPA has for years advocated that some small scale development occur so that some of the unanswered environmental questions could be answered. This remains to be our philosophy toward the development of oil shale. EPA Region VIII has provided specific guidance on its posture toward oil shale development in its Energy Policy Statement issued as a draft in Fall of 1979 and finalized in April 1980. Items addressed in the Statement which relate directly to oil shale development include 1) expedited permit processing, 2) grandfathering, 3) rate of development, 4) "Better than Bact" controls, 5) EPA input to DOI on additional leasing, 6) planning and implementing a coordinated research effort and 7) information and communication efforts.

If oil shale development proves to be economically attractive and technologically feasible, EPA advocates that development occur in an orderly phased manner. Development up to some as yet undetermined size of industry can and must occur in a manner compatible with environmental standards and objectives.

FIGURE 1

EPA LEGISLATIVE MANDATES

CLEAN AIR ACT AMENDMENTS OF 1977	PL 95-95
CLEAN WATER ACT AMENDMENTS OF 1977	PL 95-217
SAFE DRINKING WATER ACT OF 1974	PL 93-523
RESOURCE CONSERVATION & RECOVERY ACT OF 1976	PL 94-580
TOXIC SUBSTANCES CONTROL ACT OF 1976	PL 94-469
NOISE CONTROL ACT OF 1972	PL 92-574

FIGURE 2

POLLUTANTS REGULATED UNDER THE
CLEAN AIR ACT AMENDMENTS OF 1977

NAAQS	NON-NAAQS
PARTICULATE MATTER	BE
SO_2	HG
NO_x	ASBESTOS
CO	VINYL CHLORIDE
NMHC	F
O_3	H_2SO_4 MIST
PB	TOTAL REDUCED SULFUR
	BENZENE?

FIGURE 3

POLLUTANT DE MINIMIS LEVELS (CONTROLLED)

POLLUTANT	GUIDELINE FOR BACT	GUIDELINE FOR DETAILED IMPACT ANALYSIS	
CO	100 TON PER YEAR	500 $\mu g/m^3$	8 HOUR
NO_2	10 "	1 "	ANNUAL
TSP	10 "	5 "	24 HOUR
SO_2	10 "	5 "	24 HOUR
O3 (VOC)	10	-	-
Pb	1	0.03	3 MONTH
Hg	0.2	0.1	24 HOUR
Be	0.004	0.005	24 HOUR
ASBESTOS	1	1	1 HOUR
F	0.02	0.01	24 HOUR
H_2SO_4	1	1	24 HOUR
VINYL CHLORIDE	1	1	MAX
TRS			
H_2S	1	1	1 HOUR
METHYL MERCAPTAN	1	0.5	1 HOUR
DIMETHYL SULFIDE	1	0.5	1 HOUR
DIMETHYL DISULFIDE	1	3	1 HOUR
CS_2	10	200	1 HOUR
CO_S	10	200	1 HOUR

SEPTEMBER 5, 1979 FEDERAL REGISTER 40 CFR 51 AND 52

FIGURE 4

EPA MODELLING RESULTS

24 HOUR CONCENTRATIONS, IN UG/M^3

PROTOTYPE LEASE EVALUATIONS - 1976

o 200,000 BPD

	TSP	SO_2
DINOSAUR NATIONAL MONUMENT	~18	5
COLORADO NATIONAL MONUMENT	< 3	< 1
WHITE RIVER NATIONAL FOREST	~ 8	< 2
ASHLEY NATIONAL FOREST	~ 5	~ 1

PSD PERMITS - 1979

o IMPACTS ON FLAT TOPS - 62,000 BPD

	TSP	SO_2
C-A	< 0.1	0.3
C-B	0.5	< 0.1
COLONY/UNION	1.4	1.1
TOTAL	~ 2.0	1.5

$\frac{5.0}{1.5}$ x 62,000 PBD = 207,000 BPD

FIGURE 5

EPA Modelling Results - 1980

Assumptions

- o Box Model - 40 km wide, variable height
- o 400,000 BPD
- o "Colony type" emissions
- o No chemical transformation or deposition
- o No dispersion out of box
- o Homogeneous mixing

Results, 24 hour concentrations

Meteorological Case Mixing Height and Wind Speed	TSP	SO_2
2500 m, 6 m/sec	0.4 ug/m^3	0.5 ug/m^3
1000 m, 5 m/sec	1.3	1.6
500 m, 5/m/sec	2.6	3.2
500 m, 3 m/sec	4.4	5.4
400 m, 4 m/sec	4.1	5.0

Notes

Mean annual meteorological conditions

A.M. mixing height	400 m
P.M. mixing height	2500 m
A.M. wind speed	4 m/sec
P.M. wind speed	6 m/sec

FIGURE 6

PSD PERMIT EMISSION RATES

			POUNDS PER BARREL OF OIL	
POLLUTANT	COLONY	UNION	C-B	C-A
SO_2	0.164	0.237	0.160	0.668
NO_x	0.903	0.291	-	-
HC	0.158	0.125	-	-
PM	0.134	0.102	-	-
CO	0.036	0.172	-	-

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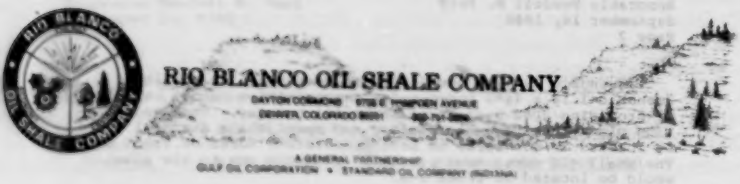
FIGURE 7

OIL SHALE VS POWER PLANT COMPARISON

	Tons per Year	
	50,000 BPD	1000 MWe
Pollutant	Colony	Power Plant
SO_2	1239	13,790
PM	1008	1,062
NO_x	6817	17,714



A GENERAL PARTNERSHIP
GULF OIL CORPORATION • STANDARD OIL COMPANY (INDIANA)

September 16, 1980

Honorable Wendell H. Ford
Chairman
Energy Resource and Materials Production
Subcommittee
Energy and Natural Resources Committee
Room 4107 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Mr. Chairman:

During my testimony before your Subcommittee on S. 2858 on September 9, 1980, there was discussion and, I believe, some confusion concerning the Rio Blanco Oil Shale Company's estimates of off-tract land requirements under different development scenarios for Tract C-a. The purpose of this letter is to provide for the record information concerning our off-tract land requirements and clarify any misunderstandings that might have resulted from my testimony.

Detailed engineering design of a major oil shale plant facility requires that the precise location and terrain for that plant be known because many aspects of engineering and design for the plant and support facilities are site-specific. Because we do not now know whether off-tract uses will be authorized or the location of these uses should they be authorized, the information shown below is necessarily approximate:

	Scenario	Acres Required: Plant Site	Acres Required: Spent Shale Disposal
1.	Lurgi Single Unit Demonstration Module	20	430 (includes crushing plant and support facilities)
2.	Modified In Situ	1200	3900
3.	Open Pit	1800	4050

Scenario 1. The Lurgi-Ruhrgas demonstration module in Scenario 1 is a 4400 ton-per-day demonstration retort capable of producing 2000 barrels of shale oil per day. The demonstration plant, crushing facilities, and spent shale disposal would be located on 450 acres of land immediately north of Tract C-a. The small (20 acre) open pit mine to supply ore to the plant would be located on Tract C-a.

Scenario 2. Modified in-situ as set forth in Scenario 2 assumes the use of off-tract lands for plant siting and spent shale disposal. Although substantially less ore is brought to the surface for processing and retorting under this scenario than would occur under the open pit mining scenario, very large quantities of low BTU by-product gas are produced using this technology. Because of this, very large amounts of acreage are required for the siting of cleanup, conditioning and utilization facilities. If off-tract land is not available, the entire surface area of Tract C-a would be required for plant and facility siting and processed shale disposal for Scenario 2.

Scenario 3. Open pit mining contemplates the use of off-tract public lands for the siting of plant and related support facilities as well as for the disposal of spent shale. The open pit project depicted in Scenario 3 is simply not economically viable if off-tract lands are not available. This is because the entire surface area would not be large enough for plant siting and spent shale disposal. The alternative of moving and rehandling spent shale two and three times is neither practical or economical.

It should be recognized that the average overburden in the area of the initial open pit on Tract C-a is approximately 200 feet thick. The oil shale resource in that area has an average thickness of 1150 feet. This means that about 1350 feet of material, over a surface area of about 700 acres, must be mined and disposed of before backfilling of the open pit may take place. Rio Blanco estimates that this may take 20 to 30 years, depending upon the pace of development. In Rio Blanco's planning it has been contemplated that the spent shale disposal area would be contoured and would not exceed 750 feet in height above the average elevation. This visual or aesthetic height limitation means that the surface area covered will be larger than the area of the open pit from which the material was originally removed.

Finally, as I indicated in my testimony, the failure to obtain the use of off-tract surface lands determines the extent to which the in-place oil shale reserves may be recovered. Set

forth below is our best judgment of recovery rate under the available extraction processes.

Extraction Process	Est. Recoverable Reserves (Billions of Barrels) With Off-Tract Land	Without Off-Tract Land
Open Pit Surface Retorting	5	0
Modified In Situ- Surface Retorting	2	1.3 - 1.6
Room & Pillar- Surface Retorting	1	.8 or .9

The reductions shown for modified in situ and room and pillar underground mining result from safety considerations in the siting of the plant site over active mining areas. There might also be additional reductions due to the need for larger pillars to support the additional weight imposed by the processed shale if it is stored over the underground mine or the modified in-situ projects.

Those of us who have been actively working to bring Tract C-a to the point of commercial development since 1974 believe that the nation should, as the prototype oil shale program initially contemplated, have the benefit of an open pit oil shale mining and retorting demonstration project. This is, we believe, the only way that the technology, the economics and the environmental considerations can be fully ascertained. Further, there are inherent technical, economic, environmental and resource recovery limitations associated with underground mining and modified in-situ technology. Should any of these prove to be severe, the open pit technology should be fully tested and advanced to the level that informed judgments can be made as to its acceptability as an option for developing the nation's huge reserves of oil shale and producing needed synthetic liquid fuels.

I hope this information is responsive to the Committee's concerns. If we can supply you with any other information please let me know.

Very truly yours,

J. B. Miller

Senator FORD. Our next witnesses are a panel consisting of Mr. Kevin Markey, Friends of the Earth, Denver, Colo.; Ms. Paula C. Phillips, Environmental Defense Fund, Denver, Colo.; and Mr. David Masselli from the Sierra Club.

We are very pleased to see all three of you this morning.

Mr. MARKEY. Senator Ford, we are pleased to be here. I would suggest in order to start that we begin with Mr. Masselli and then go to Paula Phillips and I will finish up at the rear end, if it is OK.

Senator FORD. I would make some comments to that, Kevin, but I'll restrain myself.

STATEMENT OF DAVID MASSELLI, ATTORNEY, REPRESENTATIVE OF THE SIERRA CLUB

Mr. MASSELLI. I am David Masselli. I am an attorney practicing in Washington, D.C., and I am pleased to have this opportunity to present the views of the Sierra Club on S. 2858 which would allow offsite dumping of spent shale and other proposals relating to oil shale leasing.

I request that my full testimony be included in the record, and I will summarize.

Senator FORD. Fine, David. Your statement will be included in the record, and we look forward to your highlighting it.

Mr. MASSELLI. Thank you, sir.

The Sierra Club views the initiatives contained in S. 2858 and the more sweeping proposals made by the Department of the Interior with some concern. We are late in the congressional session, and this committee is being asked to make major changes in the ground rules governing shale development. We believe that consideration of these issues at this time is premature and untimely.

It is important to note that Congress has taken several key steps this session to finally get an oil shale industry going and off the ground. The proposals made by the Department of the Interior are irrelevant to the on-going effort to develop first-of-a-kind commercial scale oil shale plants.

I would point out the request for funding under the $3 billion interim Defense Production Act program which includes final design descriptions must be made to the Department of Energy by December 1 so that anyone who is ready to go in that first round is not sitting around waiting for this legislation.

No more than one first generation commercial scale shale project could be affected by any of the proposals contained in S. 2858, and that would be the Rio Blanco project.

The changes proposed by the Department of the Interior are clearly aimed at longrun development. They raise some complex questions, particularly with regard to the impact they might have on industry structure and competitiveness. We see no reason why this committee should have to grapple with these questions at the end of its congressional session when it is clearly impossible to develop an adequate record. There is simply no emergency right now in facing the issue of the size of leases or how many leases may be owned by a single entity, nor can we see any compelling reason for Congress to reverse its previous decision on offsite disposal in the interests of a single project proponent.

The combination of huge open pit mining and massive above ground disposal of spent shale presents a series of difficult technical and environmental questions which have not yet been resolved.

Although increased resource recovery is often given as a justification, this assertion overlooks the fact that most proposed disposal sites, and particularly the 84 Mesa site previously sought by Rio Blanco in the Piceance Basin, also contain shale resources whose recovery could be prevented by such disposal. Thus, an offsite disposal plant might well increase the recovery rate for one project and its profits while significantly diminishing the overall amount of resource recovery from the public lands. The public would be the losers from such a proposal even though one company might benefit greatly.

If the committee decides it must address the issue of offsite disposal at this time, then we believe it is imperative that the procedure outlined in S. 2858 and in H.R. 7941 be improved. No lease for offsite disposal should be granted until the following steps are taken.

First, the project seeking additional land must show it has taken steps to maximize onsite disposal.

Second, the Secretary must make a finding that offsite disposal proposals are economically and environmentally sound.

Third, the Secretary must consult with the Governor of the affected State.

Fourth, the Secretary must prepare an environmental assessment in accord with the CEQ regulations which would consider feasible options, both the no offsite dumping option and alternative sites.

Finally, site selection should be done to minimize impacts. Any offsite disposal program must also face some other difficult questions. How is the fair market value of the disposal site to be helped? Does the shale project have a responsibility to care for its waste which lasts beyond the active life of the project? Is the disposal operation subject to all relevant State and local laws?

We do find ourselves in partial agreement with one proposal made by the Department. We believe that the institutional barriers for leasing shale for multimineral development should be removed, but even here we see the problem different than the Department.

The Under Secretary has used lack of existing authority for multimineral leasing as a major justification for reopening the prototype leasing program and issuing four new leases. We cannot buy this. There is no indication that any company involved in multimineral extraction is either ready or willing to move to a full-scale operation of that technology.

The leasing of one or two smaller tracts for construction of module units would be appropriate. We remain committed to our belief that the further leasing of maximum acreage tracts for commercial development must await some result of the prototype program or experience with large projects on private lands. That is a promise made by the Department when they established the prototype program in 1973, and we think it should be honored.

In conclusion, the Sierra Club would ask this committee to look carefully at the actions it has already taken to accelerate the development of first-of-a-kind oil shale. An elaborate process has

been established involving interaction of a prototype leasing program, Synthetic Fuels Corporation, the interim Defense Production Act program, Federal and State agencies with responsibility for environmental protection in the affected public and Rocky Mountain area. This process should be allowed to work itself out and lead us to the point where a reasonable decision can be made on how much further shale development is appropriate.

Many of the initiatives contained in the legislation under consideration today and the recommendation by the Department of the Interior would be best addressed when timely experience with these initial commercial operations provides answers which are not available today.

We see little to be gained by rushing toward an irrevocable commitment now. Thank you very much, sir.

Senator FORD. Thank you.

[The prepared statement of Mr. Masselli follows:]

by Ansel Adams in *This is the American Earth*

SIERRA CLUB

330 Pennsylvania Avenue, S.E.
Washington, D.C. 20003
(202) 547-1141

STATEMENT OF THE SIERRA CLUB

before the

COMMITTEE ON ENERGY AND NATURAL RESOURCES

UNITED STATES SENATE

on

S.2858 AND OTHER PROPOSALS REGARDING OIL SHALE LEASING

SEPTEMBER 9, 1980

MR CHAIRMAN, I am pleased to have this opportunity to present the views of the Sierra Club on S. 2858, a bill to amend Section 21 of the Mineral Leasing Act, and on other proposals related to oil shale leasing. The Rocky Mountain Chapter of the Sierra Club, based in the region most highly affected by shale development, will also be submitting written comments to the Committee.

We view the initiatives contained in the legislation before this Committee and in the proposals made by the Department of the Interior with some concern. The conversion of shale into a useable fuel presents a unique set of environmental, health and safety risks. The geographic concentration of the resource adds additional environmental and socioeconomic strains, particularly if massive development is contemplated. For this reason, the Sierra Club has always advocated a steady, measured approach to oil shale; one which does not make irrevocable commitments to all-out development before questions about economic viability, technological feasibility and environmental and socioeconomic impact have been adequately answered.

This Congress has taken a number of significant steps to get oil shale development moving and this Committee has played a major role in several key areas. A Synthetic Fuels Corporation has been established and given the mandate to provide financial assistance to synfuel projects. In the interim, a five billion dollar program administered by the Department of Energy is moving forward. Bids for assistance in constructing full scale plants are due by December 1, 1980 -- a scant three months

away. The interim program will make available federal assistance in the form of loans, loan guarantees, purchase and price guarantees. DOE and DOD officials have practically guaranteed that all of the $3 billion in assistance available under the interim Defense Production Act program will go to shale projects. The Department of Energy is also going forward and soliciting bids for detailed design of a modular facility.

It is important to realize that the legislation before us today is irrelevant to any of these ongoing efforts to develop first-of-a-kind, commercial scale oil shale plants. No more than one first generation commercial shale project could be affected by any of the proposals contained in S. 2858 or the broader recommendations made by the Department of the Interior. Instead, the amendments to existing law which are being suggested would have the effect of changing the groundrules by which second-generation or massive commercialization will be governed. The Sierra Club believes that consideration of the issues raised by this legislation is premature.

Let me emphasize the irrelevancy of these new oil shale leasing measures to first generation development. Right now, a handful of existing shale projects are considering whether to move forward and seek federal assistance under the interim DPA program. All of them have control over sufficient shale resources to construct at least one commercial size plant -- two on federal lease tracts, the rest on private lands. Each has selected an appropriate technology and already invested millions in designing and engineering and securing necessary environmental permits. Four have even received

conditional EPA approval of permits under the Prevention of Significant Deterioration provisions of the Clean Air Act. None of these will be significantly affected or speeded up by changes in lease size or lease ownership rules and only one (Rio Blanco) seems to have indicated any interest in changing the rules governing off-site disposal.

No, the changes proposed by the Department of the Interior are clearly aimed at long run development. They raise some complex questions, particularly with regard to the impact they might have on industry structure and competitiveness. We see no reason why this Committee should have to grapple with these questions at the end of a Congresional session when it is clearly impossible to develop an adequate record. There is simply no urgency whatsoever in facing the issue of the size of leases or how many leases may be owned by a single entity.

Nor can we see any compelling reason for Congress to reverse its previous decision on off-site disposal at the instance of a single project proponent. The combination of huge open-pit mining and massive, above ground disposal of spent shale presents a series of difficult technical and environmental questions which have not yet been resolved. Although, increased resource recovery is often given as a justification, this glib assertion overlooks the fact that most proposed disposal sites (and particularly the 84 Mesa site previously sought by Rio Blanco) in the Piceance Basin also contain shale resources whose recovery would be prevented

by such disposal. Thus, an off-site disposal plan might well increase the recovery rate for one project -- and its profits -- while signficantly diminishing the overall amount of resource recovery from the public lands. The public would be the loser under such a proposal even though one company might benefit greatly.

If the Committee decides that it must adress the issue of off-site disposal, then we believe it imperative that the procedure outlined in H.R. 7941 and S. 2858 be improved. No lease for off-site disposal should be granted until the following steps have been taken.

1. The project seeking additional lands must first show that it has taken steps to maximize on-site disposal.

2. The Secretary must make a finding that the off-site disposal proposal is economically and environmentally sound.

3. The Secretary must consult with the Governor of the affected State.

4. The Secretary must prepare an environmental assessment pursuant to the new CEQ regulations which considers feasible options (both "no off-site dumping" and alternative sites).

5. Site selection should be done to minimize impacts.

An off-site disposal program must also face some other difficult questions. For example, how is the fair market value of the disposal site to be calculated? Does the shale project have a responsibility to care for its wastes which lasts beyond the active life of the project? Is the disposal operation subject to all relevant state and local laws?

It will not be easy to design an effective program for off-site disposal of hundreds of millions of tons of spent

shale. The "spread it on the ground and leave it" approach so vigorously advocated by Rio Blanco increases the risks associated with such a program.

There is one area where we do find ourselves in partial agreement with a proposal made by the Department.We do believe that the institutional barriers to leasing shale lands for multimineral development should be removed. But even here, we see the problem differently from the Department. The Undersecretary has used the lack of existing authority for multimineral leasing as a major justification for reopening the Prototype Leasing Program and issuing four new leases. We can not buy this; there is no indication that any company involved in multimineral extraction is either ready or willing to move to a full-scale commercial operation with that technology. The leasing of one or two smaller tracts for construction of modular units would be appropriate and timely. We remain committed to our believe that further leasing of maximum acreage tracts for commercial development must await some results from the Prototype program or experience with large projects on private lands. This was the promise made by the Department when they established the Prototype Leasing Program in 1973 and we think that it should be honored.

In conclusion, the Sierra Club would ask this Committee to look carefully at the actions it has already taken to accelerate the development of first-of-a-kind oil shale projects. An elaborate process has been established, involving the interaction of the Prototype Leasing Program, the Synthetic Fuels Corporation,

best copy available

the interim Defense Production Act program, federal and State agencies with responsibility for environmental protection and the affected public in the Rocky Mountain area. This process should be allowed to work itself out and lead us to a point where a reasonable decision on how much further shale development is appropriate can be made. Many of the initiatives contained in the legislation under consideration today are best addressed at that time when experience with initial commercial operations provides answers not available today. There is little to be gained by rushing towards irrevocable commitments today before we have had an opportunity to learn from the developments already set in motion.

Senator FORD. Ms. Phillips.

STATEMENT OF PAULA C. PHILLIPS, REGIONAL COUNSEL, ENVIRONMENTAL DEFENSE FUND, DENVER, COLO.

Ms. PHILLIPS. Thank you, Mr. Chairman, and Senator Wallop. My name is Paula Phillips. I am the regional counsel, Environmental Defense Fund, in Denver. I am pleased to be able to appear here today and present the views of the EDF on S. 2858.

I have submitted my written statement and would ask that it be included in the record.

Senator FORD. It will be included in the record.

Ms. PHILLIPS. Thank you. I will briefly summarize the concerns expressed in that statement.

We are increasingly concerned over the acceleration of, especially over the last year, the pace of development activity occurring in the Piceance Basin. I think that that acceleration has been due in large part to the incentives passed by Congress over the past year, and our concern with this accelerating pace is that the development and the impact that will be occurring in the basin may outstrip our ability to keep up with those impacts and to mitigate the impacts in the basin both environmentally, the environment impacts, and specifically the socioeconomic impacts which threaten to have a tremendous effect on what is now a rural, agricultural region in northwestern Colorado.

I think one of the most dramatic indications of the recent acceleration and development is in the State of Colorado which has in the first half of this year found it necessary to increase what it calls its worst case production projections by a multiple of two. They have doubled their production projections from approximately 250,000 to 300,000 barrels per day which was their best estimate as of early 1980, to 500,000 to 700,000 barrels per day which was the State of Colorado's estimate as of July of this year, and that estimate is for Colorado only, and it is an estimate for production as of 1990, so if the production were to reach anything like the levels that are now being predicted by the State of Colorado, the

State itself estimates that the socioeconomic impact would be unmanageable.

The crux of our objections to S. 2858 are that no additional incentive to further spur the pace of development are needed at this time. It seems clear to us that more than enough development is quite likely to occur by 1990 to meet the 400,000 barrel per day goal that was set by the President, and we believe that any additional incentives that would further increase the pace of development would be counterproductive in achieving the goals that the President and the Congress have agreed they would like to achieve in the development of a commercial oil shale industry.

The technological and environmental problems and the unanswered questions regarding oil shale development are too great and too numerous to make such a risk worthwhile. This proposed legislation would work considerable changes in the Federal Land Policy and Management Act, and involves a number of very complex considerations, and we think that particularly in view of the fact that no additional incentives are needed at this time, that its passage would certainly be untimely, and that any consideration of off tract land uses such as waste disposal and off tract facility siting should be given much more long-term analysis and a much more thorough analysis of the various problems and the possible interrelationships between this type of legislation and such legislation as the Federal Land and Policy Management Act.

As the testimony of Mr. Miller has clearly indicated, the passage of this bill would certainly have the effect of encouraging strip mining of oil shale tracts. We think that in the first place there is clearly no need to test strip mining technology. There are a number of surface mines all over the West, and in the East, of course, as well, where the necessary technology is well advanced, so from the public policy standpoint to extract the shale resource, those considerations simply do not apply to the surface mining.

Second, based on the C-a lessee's own detailed development plan, their original plan which proposed surface mining and surface retorting, the tract could support a production level of approximately 55,000 barrels per day for 30 years with all facilities and disposal occurring on tract. Therefore, we question the need for the C-a lessee need for this legislation, and would suggest that the disadvantages to enacting that, particularly at this time, are quite substantial.

One of our primary concerns if Congress should deem it advisable to further consider allowing off tract facility siting and off tract disposal is to insure that the Department of the Interior engages in what will be I think crucially important environmental analyses of the alternatives, including the proposal given for off tract use and other feasibility alternatives, including alternative sites, disposal on tract or siting of the facility as indicated, alternative transportation corridors or power corridors where those are applicable; in effect the full range of alternatives needs to be assessed in deciding whether to grant the use of additional public land to an oil shale development.

I think that existing oil legislation such as the National Environmental Policy Act and the land use provisions of the Federal Land Policy and Management Act would clearly require those kinds of

analyses. However, we have been discouraged over the past several years, and particularly most recently by the Department of the Interior's commitment or lack thereof to compliance with the National Environmental Policy Act, so we are very concerned that any legislation that would allow off tract land use would insure that those kinds of analyses would occur.

We have suggested that one appropriate way to achieve this goal would be to integrate this proposed legislation with the land use planning and the right-of-way sections of the Federal Land Policy and Management Act. One part of that suggestion would be to, rather than to lease the land, to integrate this action with permits under FLPMA, and both the land use planning provisions of FLPMA and, of course, NEPA itself would mandate that kind of thorough and probing analysis of environmental impacts, the analysis of various alternatives to the action of the comparative impacts and the various ways that those impacts could be mitigated or controlled, and so we urge that those kinds of guarantees be included in any potential legislation on this issue.

We also would urge that, we have suggested in our written testimony a number of specific problems with the legislation, and I won't go through all of those now, but another important point I think is to encourage the use of backfilling because making large amounts of off tract land available can in many cases discourage backfilling, and I think the legislation should require as a condition of the granting of off tract land use, that that be utilized whether the extraction method is by underground mining, surface mining, or whether a modified in situ retort is being used, but that be required to the extent it would be consistent with mine safety considerations.

I think that pretty much has covered the highlights of our comments. Thank you.

Senator FORD. Thank you very much, Paula.

[The prepared statement of Ms. Phillips follows:]

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TESTIMONY OF THE

ENVIRONMENTAL DEFENSE FUND

ON S. 2858

BEFORE THE SUBCOMMITTEE
ON ENERGY RESOURCES
AND MATERIALS PRODUCTION
OF THE SENATE
COMMITTEE ON ENERGY AND
. NATURAL RESOURCES

September 9, 1980

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The Environmental Defense Fund (EDF) has been actively involved in oil shale issues for a number of years. We are today increasingly concerned over growing signs that our governmental agencies, at all levels, are in danger of losing control over the pace of development of the oil shale industry. This industry, which may progress very rapidly to a scale unprecedented in human history, is being fueled by the infusion of billions in taxpayers' dollars. But if the public interest is to be adequately served, it is critical that this development occur at a pace that will both insure technological progress and avoid unduly straining the human, environmental, and economic resources of the region.

One of the issues upon which EDF and many other organizations have commented frequently in the past is that of off-tract disposal. EDF strongly opposed the Department of the Interior's proposal, adopted in May, to lease additional federal tracts for oil shale development and to seek sweeping changes in Section 21 of the Mineral Leasing Act of 1920, 30 U.S.C. § 241, and the Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701 et seq. That opposition was based on a number of considerations, the most fundamental of which is the fact that additional leasing is not needed to achieve the President's 400,000 barrel per day (BPD) shale oil

production goal. For example, a recent Environmental Protection Agency count estimated a 600,000 BPD production level by 1990 without any additional leasing. And the State of Colorado has, over the past several months, been forced to double what it calls its "worst case" 1990 production projection. It now predicts that production could reach 500,000 to 700,000 BPD by that year. As the Director of the State's Department of Natural Resources testified, if production were to reach those levels in the next decade, "the impacts would be staggering and, if quality of life has any meaning at all, unmanageable." (Statement of Monte Pascoe to United States Senate Budget Committee, July 17, 1980.)

The vastly accelerated activity that forced this drastic upward revision has been generated in large part by the numerous incentives, including substantial tax benefits, enacted by Congress over the past year. One unfortunate side-effect of these incentives may be to encourage the use of more traditional technologies (in order to be first in line) and concomitantly to hamper the development of experimental methods that might prove preferable economically, environmentally, and technologically.

The crucial issue in our view, and the crux of our objections to S. 2858, is that, like additional leasing, the added incentives offered by this proposed legislation are not needed to spur production and may in fact be counter-productive

to the goals Congress has sought to further through its recent legislative actions.

The lessees of tract C-a -- Gulf Oil Corporation and Standard of Indiana (Rio Blanco) -- and the Department of the Interior, have sought off-tract disposal authority for over six years. This latest effort deserves to meet the same fate as its predecessors; granting lessees virtually unfettered use of off-tract public lands would be both untimely and unwise.

The exercise of such authority, for example, would almost certainly result in open-pit mining of Tract C-a, instead of modified-in-situ development as currently planned. Open-pit mining clearly is not a technology that requires expeditious testing. There are strip mines scattered throughout the West; the technology is comparatively well-advanced.

Moreover, resort to open-pit mining would likely accelerate the expected pace of development, perhaps beyond our ability to control adverse impacts effectively. Based on Rio Blanco's original detailed development plan, open-pit mining coupled with off-tract waste disposal could result in production at 300,000 BPD, or three times greater than that envisioned in the 1973 environmental impact statement (EIS). Additional production of such magnitude, in conjunction with projections for other facilities in the region, could transform

the rural Piceance Basin into a socio-economic and environmental disaster area.

Anticipated production levels even now vastly exceed what the State of Colorado believes is feasible in terms of coping with population increases. Recent legislative incentives and Interior's leasing decisions already pose the very real risk that development impacts could quickly outpace efforts to mitigate them. This legislation would exacerbate that situation further. There is no need to encourage even greater production -- and inflict even greater problems on the region -- by facilitating large-scale open-pit mining. The technological and environmental uncertainties of commercial-scale shale oil production are still much too great to justify such risks.

Availability of additional land for waste dumping and/or facility citing is not necessary for commercial scale operations on Tract C-a, even if Rio Blanco utilizes strip mining and surface processing. The lessees' original detailed development plan clearly demonstrates that they can accommodate on tract all activities of a 55,000 BPD operation for 30 years.

In addition, off-tract dumping would discourage, if not eliminate, backfilling of open pits, underground mines, and abandoned modified-in-situ retorts. Backfilling would obviously reduce surface disposal needs, and has been proposed as a possible leaching control method.

Finally, enactment of this legislation, while it might enhance Rio Blanco's resource recovery, would threaten significant resource losses to the public. For example, a USGS expert comparing the reserves of Tract C-a with those of 84 Mesa (Rio Blanco's desired waste dump) found that 84 Mesa exceeded tract C-a in high grade shale, nahcolite, and dawsonite.

For all of the foregoing reasons, EDF opposes S. 2858 in its entirety. We would, however, address some comments to the specific provisions of S. 2858 and to ways in which the proposed legislation could be strengthened to mitigate some of the adverse impacts of off-tract.disposal and facility-siting.

(1) The bill's limitation of off-tract leases to any entity "currently holding a lease" is ambiguous. It should be amended to specify that only those entities holding leases issued in 1974 are eligible for its benefits. The issue of off-tract dumping has never been analyzed and evaluated by the Department of the Interior in an environmental impact statement. The Department must do EISs on its renewed prototype leasing and permanent leasing program proposals. Any decision with respect to off-tract land use by future prototype lessees should await this evaluation and the public input and debate thereon.

(2) The limit of 6400 acres is unduly high, and could more than double the public land controlled by each operation.

(3) The grant of authority to lease "for any purpose" connected with the operations other than mining is exceedingly broad. By its terms the bill would authorize the use of this off-tract land for, e.g., massive reservoirs, power plants, housing developments, and any number of other "purposes" only tangentially related to the on-tract operations. It would thus usurp, in the oil shale context, FLPMA's very carefully drawn right-of-way provisions for these and/or similar facilities. We strongly oppose such a sweeping amendment of FLPMA, and urge that this legislation be redrawn to integrate it thoroughly with both the right-of-way and the land use planning provisions of FLPMA.

(4) The section requiring the consent of any other federal agency having surface jurisdiction should expressly subject such other agency's decision to the standards contained in this legislation.

(5) In addition to the required consultation with the Governor of the affected State, off-tract use must be subject to local and state laws and ordinances. It is, of course, the states and localities that must pay the vast majority of the costs associated with rapid population growth and energy boom town development. For example, Colorado estimates that, to meet the demands of energy development in the northwestern part of the State, it must spend more

than $1 billion by 1990 on expanded facilities and services, not including costs for public utilities and transportation. State and local agencies must be able to deal rationally through their lawful authorities with these problems. In addition, the states' jurisdiction over reclamation is crucial, and its abrogation could create a significant void.

(6) The required demonstration of necessity for additional lands is a critically important provision. The legislation should include, in addition, such specific criteria as will insure maximum safe utilization of backfilling and a showing that use of the lease tract itself for the proposed disposal and/or facilities is either technically infeasible or environmentally unacceptable.

(7) The requirement that the lessee demonstrate that he can conduct operations in an "environmentally proper manner" is acceptable as far as it goes, but it poses some significant problems in light of the Tenth Circuit's decision in EDF, et al. v. Andrus et al., 619 F.2d 1368 (1980), and the Department of the Interior's recent record under the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321 et seq.

As enacted by Congress and interpreted by the courts over the past decade, NEPA would clearly apply to any decisions contemplated under this legislation that threatened significant

environmental impacts. And the analyses required by NEPA are ideally suited to these decisions. In determining whether to issue an off-tract lease, the decisionmakers should identify -- necessarily on a site-specific basis -- all feasible alternatives; assess the environmental impacts of those alternatives; and alalyze potential mitigation measures. Clearly, the EIS format is perfectly designed to meet these needs.

We emphasize that this NEPA assessment need not result in a multitude of paperwork on cause undue delay, particularly under CEQ's "streamlining" regulations. Indeed, these analyses should most appropriately be integrated into the required NEPA examination of the detailed development plan, and the FLPMA land use process.

In EDF v. Andrus, however, the Court, in a radical departure from prior law, accepted a "substantial compliance" theory, allowing a multitude of activities more or less loosely related to environmental quality to substitute for the "detailed statement" specifically required by Congress.

Thus, it is not inconceivable that the legislation as it now stands could be interpreted by this Court as supplanting NEPA insofar as these decisions are concerned. This would be totally unacceptable for any number of reasons, two of which are that it would leave the environmental assessment responsibilities almost solely in the hands of the leasee instead of the responsible federal official, and it would

negate the public information and participation provisions of NEPA.

Moreover, the Department of the Interior has given every indication that it will read this decision in the broadest conceivable manner. Its approach to renewed prototype leasing, for example, has hardly inspired confidence in its dedication to NEPA. Interior's decision to lease up to four additional tracts of land -- an action that clearly comes within NEPA's parameters and one that, even under the EDF v. Andrus decision, could not conceivably have been "analyzed" in the 1973 EIS -- was reached without so much as a pro forma nod in the direction of NEPA. And this despite explicit commitments in the 1973 EIS to prepare another environmental statement "if it is ever proposed that a leasing program should be entered into beyond the six prototype tracts covered in this proposal." (Vol. IV at III - 190 to 191, emphasis added.)

(8) In addition to fair market value rental, the legislation should require bonus payments and specify that the "rights granted" include opportunity costs of reduced resource recovery.

(9) We support the addition of the limitation on transferability provision in H.R. 7941 (p. 3, l. 8-12) to S. 2858.

Thank you for the opportunity to testify on S. 2858.

Senator FORD. Mr. Markey.

Mr. MARKEY. Thank you, Mr. Chairman. My statement is quite lengthy. I will summarize it.

Senator FORD. Your statement will be included in the record.

Mr. MARKEY. Thank you. There are some figures attached at the end.

Senator FORD. Fine. They will be included.

STATEMENT OF KEVIN L. MARKEY, REPRESENTATIVE, FRIENDS OF THE EARTH, DENVER, COLO.

Mr. MARKEY. Friends of the Earth appreciates this opportunity to comment on the proposed oil shale leasing legislation. We are joined in these comments by the Colorado Audubon Council, the Colorado Open Space Council, the Colorado Mountain Plains Congress of Senior Organizations, Rocky Mountain Greenpeace, Southern Utah Residents Concerned About the Environment, and Two Rivers Citizens Association.

The environmental community has fought the concept of off tract waste disposal for 8 years now. We believe that it is unnecessary and contrary to the spirit of a limited prototype oil shale leasing program.

Several other amendments to the Mineral Leasing Act have been recommended by the Department of the Interior. With some limited exceptions, we believe these are also unnecessary, premature, and contrary to the intent of the prototype program to stimulate innovation and commercial development at reasonable, orderly rates.

Our Nation's success in reaching the President's 400,000 barrel per day shale oil production goal and the fate of this legislation are entirely unrelated. The Federal leaseholders who seek off tract disposal rights already have a plan to carry them to 76,000 barrels per day. Also the ability of existing participants in the prototype program to further solidify their primacy in the industry by obtaining up to four additional tracts each will only affect second generation oil shale expansion before we have any results from the first generation pioneer industry.

We have been long concerned by oil shale development, and this committee is familiar with shale's impacts. Briefly, the most critical problems are costs and social disruption of rapid community development. Rich wildlife resources in the oil shale region are threatened. Air quality degradation is a tremendous potential. Shale oil extraction is a big consumer of water.

The most serious effect which impacts this legislation on the quality of the physical environment, and the least understood, is water quality degradation and ecological disruption from massive waste disposal. Each year a 500,000 barrel per day industry will generate more than 200 million tons of waste laced with salts and toxic materials such as molybdenum, selenium, arsenic, fluoride and boron and organic materials.

Whether left behind in large surface dumps or underground in abandoned retorts, rain water, snowmelt, or ground water may contact the spent shale, dissolve the undesirable salts or chemicals, and eventually carry them into the Colorado River system which is already notoriously high in salinity. Reclamation experts have de-

fined extensive management techniques capable of increasing revegetation success. Revegetation is necessary to reduce the erosion and minimize permanent habitat loss. However, the control of leachates from in situ retorts, the hydrology of spent shale management, embankment stability, long-term erosion, biological toxicity, and permanent custodial care are remaining unanswered questions.

This year price hikes for foreign crude and decisions made by Congress will make at least a moderately sized oil shale industry a reality. Proceeding to commercial development between now and 1982 are at least the firms listed in our testimony based on public announcement of strong intentions communicated to various Federal agencies. Uncertainty plagues some properties, but favorable circumstances could add several others.

Thus, between 440,000 and 630,000 barrels per day of shale oil production is likely without additional leasing activity except in the case of multimineral processing, and without the proposed leasing legislation.

The recent Supreme Court ruling regarding the patenting of oil shale claims will also increase the resources available for commercial development. Recognizing that production much beyond these levels would start to conflict with water availability and air quality and other environmental concerns, and realizing further that the President's goal could just as easily be reached without additional resource availability, Friends of the Earth was joined earlier this year by 13 other groups in encouraging the Secretary of the Interior to approach the program with extreme caution.

We recommended that testing of multimineral processing technology may be appropriate under certain conditions, but only under a prototype lease. We saw a weakness in the narrow technological diversity in the prototype program and recommended that the Department seek statutory authority to obtain environmental data from projects on private land where other technologies were planned if such projects received Federal financial assistance. The Interior could then coordinate the data from those private lands with information obtained from the prototype tracts to get a broad assessment of the pioneer industry on which to base more intelligent and informed future decisions.

It could obtain such data without building more facilities and duplicating environmental impact. We also suggested that steps be taken to insure that new prototype lease tracts not duplicate the technologies already tested elsewhere.

Finally, most important, we acknowledged the possibility of a larger industry in the future either because a crisis may force it prematurely or because we may decide, based on observations of first generation plants, that an expanded industry is acceptable, and the planning necessary to prepare for it. Today we believe no one can make a judgment about the second generation of oil shale facilities. We do not think there is sufficient information on which to design a permanent leasing program.

The prototype program has yet to produce a single barrel of shale oil and will not produce commercial quantities until at least 1986, regardless of our actions today.

Therefore, instead of recommending that the Interior start designing a permanent program, we are proposing analysis and design of comprehensive regional resource management strategies to protect resources other than shale—air quality, water, wildlife, areas of critical environmental concern, and people—from the effects of this development and other area energy activities.

More than anything, however, our proposals on leasing were designed to prepare for the future in an orderly manner without preordaining the future for which we do not know how to prepare.

The Department was not nearly so moderate as our approach. It decided to request the removal of practically every statutory restraint on its leasing authority, to double the existing prototype program, to ignore activities and data opportunities on private tracts, to guarantee the unfettered discretion of new lessees in their choice of technologies and thus guarantee the failure of the expanded program, and to prepare by 1982 a permanent leasing program at least 3 to 4 years before any commercial-scale production on private or public lands.

Briefly, identifying the information needed before we can properly design a permanent oil shale leasing program, we need a greater understanding of air pollution dispersal, the applicability of present-day air emission control technologies, regional hydrology must be better understood, waste disposal and how to manage it must be better understood. Wildlife behavior is an important factor still not fully understood especially on a regional basis. The success of institutions to mitigate social impacts also needs to be evaluated.

Many of these unknowns will handicap our ability to design adequate protections into a permanent leasing program. For this reason, we applaud the House of Representatives for rejecting the attempts to allow multiple user ownership and larger tract size, and encourage the Senate to do likewise.

The Department's proposal to increase allowable lease tract size is certainly not needed in Colorado. Using conservative underground mining methods, the two Colorado tracts could sustain a 50,000 barrel per day plan for 113 and 62 years respectively, using shale only richer than 30 gallons per ton. The need for larger tracts in Utah is less clear. However, the reserves, for example, on the two Utah tracts are each capable of sustaining a 50,000 barrel per day plant for 21 to 23 years. These are economically processing lifetimes.

The detailed development plans for the unitized U-a and U-b tracts identified a total of 100,000 barrel per day production there when title conflicts are finally resolved. The use of leaner shales will increase recoverable reserves and the economic life of the property.

Even if Utah tracts are identified which possess subeconomic quantities of oil shale for conventional processes, they may be adequate for innovative technologies not dependent on high-grade shale such as geokinetics technology. In fact, DOI's computation of reserves and the delineation of tracts, based on such high minimum acceptable grades as 30 gallons per ton, encourages high grading and discourages the use of lower grade materials because it insures that adequate high-grade resources are available during the economic life of the project.

There are several other mechanisms which can be used to obtain economic quantities of oil shale for new prototype operations. Joint ventures may wish to unitize two or more adjacent Federal tracts as done on U-a and U-b. Firms may unitize a Federal lease with associated private claims or state leases.

Recently, proposed by some developers is bidding by request for proposals. This may facilitate the unitizing of Federal and non-Federal land. Bidding in response to an RFP involves offering not just bonus, but also specific tract delineation, royalty, technology, environmental programs, and other competitive factors. While we have not come to a position on RFP bidding, we believe it has intriguing possibilities.

If the committee decides that increased tract size should be authorized, there should be strict bounds on its use. The Department only proposes to authorize increased lease tract when a larger area is required to permit long-term commercial operations. This vague, unenforceable language could allow inclusion of the entire Federal portion of the Piceance Basin in a single least tract.

Two restrictions must be placed on a maximum lease size. Strict geological criteria and in addition economic criteria must prohibit large-sized tracts from exceeding large resource recovery per year.

To suggest, as the Department does, that a prototype program originally intended to make available under carefully controlled conditions a limited number of leases needs authority suddenly to offer up to five leaseholdings to a single firm if additional prototype lease offerings are to be successful, or that such demonstrated resource management will encourage innovative technologies, truly boggles the imagination.

The proposal will concentrate industry ownership of Federal resources among a few firms. Related to ownership concentration is technological innovation. The Department of the Interior somehow has concluded that multiple ownership will encourage innovation. We disagree. The willingness to experiment with new processes or mining methods depends on reduced financial risk, not resource availability, and usually occurs outside a tract of land, a large tract of land, on which commercial development is required by due diligence.

Specialized financial incentives are most productive in encouraging innovation. However, making additional land for commercial development available to a company may have exactly the opposite effect. The company's capital resources will be strained by a single multibillion dollar oil shale project. Multiple projects will increase the risk and lead to more conservative approach to management. It is unlikely that the second tract will attract more than a few increased efficiencies in the original design used on the first tract.

Experience to date indicates that the proprietary interest in technologies or favorable cost arrangements are more important than the choice of processing technique by developers.

The only promising new processes are two multimineral methods, geokinetics and a very, very experimental microwave retorting which is probably not ready for leasing at all, and may require Federal land, but multiple tract ownership by others may reduce the probability of their obtaining the need for Federal lands.

There are several grounds on which to oppose the third administration authorization of public land use outside of lease tract boundaries. Allowing off tract disposal will allow the expansion of at least one moderately sized operation to a monstrous 300,000 barrel per day open pit mining and retorting complex.

Recently, in support of its effort to obtain off tract disposal privileges, Rio Blanco has cited the larger mining volume in its new modified in situ technique as a reason for its renewed interest in this legislation. This begs the issue; as they indicated today, they will probably proceed with an open pit mine.

Diagrams of Rio Blanco's plan reveal its immensity. The pit could be the start of a large moving pit which would advance across the Piceance Basin, and I would refer you to our figure on that.

The effect of off tract disposal or facility siting is to increase the lessee's resource recovery on its own property at the expense of resource recovery on the public lands. We have dealt with this in a little bit more detail in the testimony, and certainly in the public record from previous hearings on this subject.

By requiring that lessees pay fair market value for the use of off tract lands, the bills before the committee partially address this concern. However, the bills are still insufficient. In determining fair market value, the property must include the surface value of the land for a permanent land use, and the opportunity costs represented by reduced resource recovery on the land being used for disposal or other permanent fixtures.

Tract C-a was sold to Rio Blanco on January 8, 1974. The lessee complained that before that date they were unaware that off tract disposal might be illegal and cite the 1973 final EIS on the prototype program as contemplating off tract disposal.

However, there were several citizen challenges to this concept much earlier. It is true that the legal position of the Department was clarified only after the lease sale. However, it is hard for us to believe that Gulf and Amoco were completely unaware of questions which were being raised and the opinions of the solicitor. It is even more amazing to fathom how the prospective lessees of C-a could nearly 1 year after the Alaska Oil Pipeline Supreme Court decision believe that DOI could grant a special use permit to avoid the requirements of the Mineral Leasing Act. Just because an environmental impact statement contemplated something illegal doesn't make it legal.

The first mention of off lease disposal by the Department related to the possibility of disposal in the Douglas Creek area west of the Cathedral Bluffs, according to the draft EIS. This was protested by several citizens. The National Audubon Society in its written comments complained that plans for off lease disposal is a means of circumventing the maximum acreage provision for sites leased under the Mineral Leasing Act of 1920.

DOI did not respond. Because of the hypothetical nature of the EIS's discussion, little direct citizen action was forthcoming until just before the lease sale. Basically, this is explained further in the written testimony. There was never any clear indication that the Department did in fact intend to allow offsite disposal until several

meetings and letters between citizens and BLM, and then the Department's position was clarified only after the lease sale.

Representative Charles Vanik requested an opinion from the Comptroller General about offsite disposal. It was staff's January 30 reply which identified for the first time for citizens a definitive objection to off lease dumping.

The Department of the Interior's apparently deliberate attempt to confuse the public regarding its intentions made it impossible for citizens to obtain an early ruling on the legality of off lease disposal. The responsibility for delaying until after the lease sale any legal uncertainties for the lessee is shared only by the Department.

The currently approved plan for C-a contemplates a 76,000 barrel per day operation of combined modified in situ and surface retorting. Disposal will be limited to the Rinky Dink Gulch on tract. If C-a retains the MIS option, it intends to change the MIS design to double mining and the spent shale volume which must be disposed. C-a's need for off lease disposal under those conditions assumes that no attempt will be made to backfill abandoned modified in situ retorts, a strategy which can reduce surface waste disposal and may eliminate the need for off tract disposal. It can reduce and may eliminate leaching of salts in retorts.

The original plan included maps which identified the approximate extent of mining at projected 55,000 barrel per day levels after 30 years. Those are attached, and they indicate that sufficient room is available to accommodate all operations on tract.

Ironically, the 1973 final environmental impact statement on the prototype program which is legally sufficient for the evaluation of all impacts on tract C-a, according to recent court rulings, also contradicts Rio Blanco's arguments.

Volume III determines that the total acreage requirement for processing facilities, the open pit mine, and disposal of overburden and spent shale over a period of 16 years at 100,000 barrels per day or 30 years at 50,000 barrels per day is 4,400 acres. This is less than the tract size.

One further argument is made for off tract dumping by the proponents—the high cost of moving the overburden waste twice. We would point out that in order to reduce certain environmental impacts, this overburden must be moved twice anyway. If off tract land use authority is granted, it clearly must be subject to a clearly demonstrated need.

Both bills before this committee mention tests, but neither spells out criteria for that need. It is important. This would be an important improvement in the legislation, and we recommend language in the testimony.

One tool to evaluate the environmental acceptability of a proposed off tract land use is an environmental analyses of disposal or other land use alternatives. Given our recent experience with the Department of the Interior, it is unlikely it will do an adequate and publicly accountable analysis of the alternatives without some stiff legislative stimulus.

Because of the 1973 EIS, we believe the Department will attempt to stretch the court's opinion in *EDF et al.* v. *Andrus* to illogical and deleterious extremes because the 1973 EIS contemplated did

not analyze actual disposal options. As indicated here, that EIS clearly only included hypothetical schemes and did not actually evaluate the differences between different lease disposal sites or options.

It is important, therefore, not only to require the disposal site be environmentally acceptable, but the Secretary should evaluate disposal for land use alternatives for a number of sites and methods, including on-tract disposal, backfill method, and other waste management techniques in an environmental impact statement, and select from the alternatives which exhibit the least environmental effects, the most favorable resource recovery balance, and acceptable costs.

The environmental impact statement need not take a long period of time. Already available to the Department is extensive baseline data and other documents to speed that up, and such process could proceed parallel with other approvals which would be required for a change in tract C-a's development plan without delaying the final decision.

I will conclude there because it is getting quite late, and I appreciate the opportunity to testify.

Senator FORD. Thank you very much, Kevin.

[The prepared statement of Mr. Markey follows:]

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TESTIMONY OF

KEVIN L. MARKEY

FOE Colorado Representative

BEFORE THE

SENATE SUBCOMMITTEE ON ENERGY RESOURCES AND

MATERIALS PRODUCTION

ON

H.R. 7941 AND S. 2858

OIL SHALE LEASING LEGISLATION

9 September 1980

Friends of the Earth appreciates this opportunity to comment on proposed oil shale leasing legislation. We are joined in these comments by the Colorado Audubon Council, Colorado Open Space Council, Colorado Mountain Club, Mountain Plains Congress of Senior Organizations, Rocky Mountain Greenpeace, Southern Utah Residents Concerned About the Environment, and Two Rivers Citizens Association.

The environmental community has fought the concept of off-tract waste disposal for eight years now. We believe that it is unnecessary and contrary to the spirit of a limited prototype oil shale leasing program. In our testimony we will explain the reasons for these beliefs. In addition, however, we intend to discuss how various amendments to S. 2858 may overcome some -- but not all -- of our objections.

Several other amendments to the Mineral Leasing Act have been recommended by the Department of the Interior. With some limited exceptions, we believe these are also unnecessary, premature, and contrary to the intent of the prototype program to stimulate innovation and commercial development at reasonable, orderly levels.

Our nation's success in reaching the President's 400,000 barrel per day (BPD) shale oil production goal and the fate of this legislation are entirely unrelated. The federal leaseholders who seek off-tract disposal rights already have a plan to carry them to 76,000 BPD. Also, the ability of existing participants in the prototype program to further solidify their primacy in the industry by obtaining up to four additional tracts each will only effect second generation oil shale expansion, before we have any results from the first generation pioneer industry.

Summary of Oil Shale Development's Environmental Impacts

The environmental community has long been concerned by oil shale development. This committee is familiar with shale's impacts, so let us briefly summarize the most critical problems:

* The costs and social disruption of rapid community development, already tripling and quadrupling crime rates in Rifle and Meeker after only a few years of construction on existing federal prototype tracts, is and will continue to be the most immediate and direct effect felt by the people of oil shale country. The Colorado West Area Council of Governments testified before the Senate Budget Committee at the end of August that it will be difficult to prepare for a 200,000 BPD industry, much less a larger one.

* There are rich wildlife resources in the oil shale region, including North America's largest migratory deer herd. The White River deer herd is in equilibrium with its environment, as small stresses such as precipitation variability and weather severity have significant effects on populations. An industry and associate traffic will cause significant harm to this economically important wildlife resource.

* Even with very high pollution control efficiencies, air quality and visibility degradation will certainly affect Colorado's third largest industry -- recreation and tourism. Control efficiencies for sulfur already approach 99.6%. Without significant improvements in those controls, a very large oil shale industry (3 million BPD or more) will exceed health standards.

* Shale oil extraction is a big consumer of water -- a critical problem in a water short region. Between 2.1 and 5.0 barrels of water are consumed to produce a barrel of shale oil. Based on conservative assumptions regarding virgin flow of the Colorado River and interpretation of law governing its use, an oil shale industry of between 500,000 and two million BPD can peacefully co-exist with other users, depending on the rate of growth in water demand. Beyond these limits, water must be imported from the Columbia or Missouri River systems, a prospect not savored by our neighbors to the North. Otherwise, the industry will purchase more agricultural water to grow. Even a moderately sized industry will require significant new water storage facilities and their attendant impacts. The cost of water will be bid upwards.

* By far the most serious effect on the quality of the physical environment and the least understood is water quality degradation and ecological disruption from massive waste disposal. Each year a 500,000 barrel per day industry will generate more than 200 million tons of waste laced with salts and toxic materials (such as molybdenum, selenium, arsenic, flouride, and boron). Whether left behind in large surface dumps or underground in abandoned modified in situ (MIS) retorts, rain water, snowmelt or groundwater may contact the spent shale, dissolve the undesirable salts or chemicals and eventually carry them into the Colorado River System, which is already notoriously high in salinity. Reclamation experiments have defined extensive management techniques capable of increasing revegetation success. Revegetation is necessary to reduce erosion and minimize permanent habitat loss. However, the control of leachates from in situ retorts, the hydrology of spent shale management, embankment stability, long term erosion, biological toxicity, and permanent custodial care are remaining unansvered questions.

New Leasing is Not Necessary to Achieve Presidential Production Goals

This year price hikes for foreign crude and decisions made by Congress will make at least a moderately sized oil shale industry a reality. Proceeding to commercial development between now and 1992 are at least the following firms, based on public announcements or strong intentions communicated to various federal agencies:

Rio Blanco (tract C-a)	76,000 BPD
Cathedral Bluffs (tract C-b)	88,000
Colony (Exxon & Tosco)	47,000
Union	50,000
Geokinetics	40,000
Tosco (Utah property)	50,000
Paraho (Sun/Cliffs)	9,000
Chevron	100,000

Uncertainty plagues some properties, but favorable circumstances could add the following production:

Paraho (full potential of Sun/Cliffs site)	41,000

White River (tracts U-a & U-b, which will soon file new development plans in anticipation of the resolution of title conflicts) 100,000
A lease for multi-mineral process testing 50,000

Thus, between 440,000 and 630,000 BPD of shale oil production are likely without additional leasing activity except in the case of multi-mineral processing and without the proposed leasing legislation. The recent Supreme Court ruling regarding the patenting of oil shale claims will also impact the resources available for commercial development. Although several decisions must still be made before the disputed claims are patented, substantial quantities of rich oil shale are involved. Large blocks of claims by Tosco and Union lie in rich shale near tract C-b, and a large block claimed by the Ertl estate lies just west of tract C-a.

Citizen Proposals on Oil Shale Leasing

Recognizing that production much beyond these levels would start to conflict with water availability and air quality, and realizing that the President's goal could easily be reached without additional resource availability, Friends of the Earth was joined by thirteen other groups in encouraging the Secretary of the Interior to approach a new leasing program with extreme caution. Yet, we tried to be constructive in our suggestions to the Secretary.

We recommended that testing of multi-mineral processing technology (in which nahcolite, a sodium bicarbonate ore useful in pollution control, dawsonite, an aluminum ore, and soda ash are extracted with the shale oil) may be appropriate under certain conditions, but only under a prototype lease. We saw a weakness in the narrow technological diversity in the prototype program and recommended that the Department seek statutory authority to obtain environmental data from projects on private land where other technologies were planned, if such projects received federal financial assistance. Interior could then coordinate the data from private lands with information obtained from the prototype tracts to get a broad assessment of the pioneer industry on which to base more intelligent and informed future decisions. It could obtain such data without building more facilities and duplicating environmental impacts. We also suggested that steps be taken to ensure that new prototype lease tracts not duplicate technologies already tested elsewhere (like has happened on tracts C-a and C-b).

Finally, and most important, we acknowledged the possibility of a larger industry in the future (either because a crisis may force it prematurely or because we may decide, based on observations of a first generation of plants, that an expanded industry is acceptable) and the planning necessary to prepare for it. Today, we believe no one can make a judgment about a second generation of oil shale facilities. We do not think that there is sufficient information on which to design a permanent leasing program. The prototype program has yet to produce a single barrel of shale oil and will not produce commercial quantities until at least 1986, regardless of our actions today. * Therefore, in-

* This is not due to environmental litigation or disputes. The DOI official who oversees the prototype program has often announced that no environmental regulatory action has ever delayed program activities, "not one day." The long design and construction lead times and the technical uncertainties are responsible for all delays and the long schedule.

stead of recommending that Interior start designing a permanent program, we proposed the analysis and design of comprehensive regional resource management strategies to protect resources other than shale — air, water, wildlife, areas of critical environmental concern, and people — from the effects of its development and other area energy activities. We felt that this approach could prepare us for future leasing without forcing us to accept the specific details of a leasing program long before we knew how to design it. Such a resource management plan could define more clearly today's unknowns and identify certain protective strategies which could guide even a crash program if international affairs forced that unfortunate situation.

We acknowledge, though we do not condone, the likely achievement of President Carter's 400,000 BPD goal by the end of the decade. We will work to minimize the adverse impacts of whatever industry is established. * More than anything, however, our proposals on leasing are designed to prepare for the future in an orderly manner without preordaining the future, for which we do not now know how to prepare.

The Department was not nearly so moderate. It decided to request the removal of practically every statutory restraint on its leasing authority, to double the existing prototype program, to ignore activities and data opportunities on private tracts, to guarantee the unfettered discretion of lessees in their choice of technologies (and thus guarantee the failure of the expanded program), and to prepare by 1982 a permanent leasing program — at least three to four years before any commercial scale production on private or public lands.

Information Needed Before Designing a Permanent Program

Let us briefly identify the information needed before we can properly design a permanent oil shale leasing program. (We would point out that the legislation regarding lease size and ownership is more appropriately part of a permanent program, despite Interior's claim that it is necessary for the prototype program.)

* An understanding of air pollutant dispersal is important to site oil shale plants in a way to minimize ambient air quality degradation in critical air sheds. The topography of the oil shale region is complex, and we await the design and verification of a model capable of defining air quality in the area.

* The applicability of present day air emission control technology to shale oil processing off-gases has not been demonstrated.

* Regional hydrology is still scarcely understood despite intensive investigations. The discovery of five distinct groundwater aquifers on tract C-b and equally surprising discoveries on tract C-a immediately rendered the classical two-aquifer model of the Piceance Basin (one above the oil-rich Mahogany zone, and one below with generally lower water quality) obsolete. Hydrology is important to design mining operations, for the choice of a technology, to understand pollutant transport and to site waste disposal, to obtain water supplies, and to protect existing users of surface water.

* Our contribution to that effort can be productive. Comments of FOE and EDF on an air quality permit for Colony Development Operation resulted in EPA condition of approval which will mean 30% less SO_2 emissions during commercial operations than initially projected.

* Waste disposal, as indicated above (page 2), is still plagued with many uncertainties. A better understanding is important for siting of disposal sites, reducing water quality problems, designing long term custodial care, and defining waste management regulations. State reclamation protections are relatively weak, according to the Office of Technology Assessment.

* Wildlife behavior is being closely studied on and near lease properties, but it remains poorly explored on the more important regional scale. Critical habitat and migratory patterns are citical for the siting of shale plants but are not well understood.

* The success of institutions to mitigate social impacts is untested in northwest Colorado, except in Craig, where they proved grossly inadequate. Most thoughtful people already recognize even the more recent innovations' inadequacy. They must be improved before going beyond a pioneer industry.

Many of these unknowns will handicap our ability to design adequate protections into a permanent leasing program. It is thus imperative to avoid legislation which will allow the establishment of a permanent program. For this reason, we applaud the House of Representatives for rejecting attempts to allow multiple lease ownership and larger tract size and encourage the Senate to do likewise.

The Problems With Increasing Tract Size

The Department's proposal to increase allowable lease tract size is certainly not needed in Colorado. Most of the federal resources there are greater than 150 feet thick and greater than 25 gallons per ton (gpt) in-grade. Using conservative underground mining methods, the two Colorado tracts could sustain a 50,000 BPD (90% stream factor) plant for 113 and 62 years respectively, using shale only richer than 30 gallons per ton.

The need for larger tracts in Utah is less clear. The only publicly available estimates of recoverable reserves on Utah's two federal tracts (the 1973 Prototype Program EIS and the Detailed Development Plan) indicate that 30 gpt or richer shale or the Mahogany zone can sustain 50,000 BPD plants on each of the tracts for 21 to 23 years. These are economically acceptable processing facility lifetimes. The detailed development plans for the unitized U-a and U-b tracts identified a total of 100,000 BPD production there when title conflicts are resolved. The use of leaner shales will increase recoverable reserves and the economic life of the property.

Even if Utah tracts are identified which possess subeconomic quantities of oil shale for conventional processes, they may be adequate for innovative technologies not dependent on high grade shale. One example often cited as a candidate for a Utah tract is Geokinetics, which has a small capital cost component and few economies of scale. It will not require a 50,000 BPD minimum production unit and has proposed a commercial 20,000 BPD plant for scattered state holdings. In fact, DOI's computation of reserves based on such high minimum acceptable grades encourages high grading and discourages the use of lower grade materials because it ensures that adequate high grade resources are available during the economic life of a facility.

There are several other mechanisms which can be used to obtain economic quantities of oil shale for new prototype operations:

* Joint ventures may wish to unitize two or more adjacent federal leases. This was done with U-a and U-b and was proposed for the Wyoming leases.

* Firms may unitize a federal lease with associated private claims or state leases. This is necessary in Wyoming, where Union Pacific shares ownership of large areas on a checkerboard pattern, and in Utah where several state leases already exist.

* Recently proposed by some developers is bidding by request for proposals (RFP). This may facilitate the unitizing of federal and non-federal land. Bidding in response to an RFP involves offering not just bonus, but also specific tract delineation, royalty, technology, environmental programs, and other competitive features. While we have not come to a position on RFP bidding, we believe it has intriguing possibilities.

If the Committee decides that increased tract size should be authorized, there should be strict bounds on its use. The Department only proposes to authorize increased tract size when "a larger area is required to permit long-term commercial operations." This vague, unenforcible language could allow, for example, the inclusion of the entire federal portion of the Piceance Basin in a single lease tract. Two restrictions must be placed on maximum lease size:

(1) Strict geological criteria, including bed thickness and average shale grade, must govern where larger tracts are allowed, to prevent monopolization of high grade resources.

(2) In addition, strict economic criteria must prohibit large-sized tracts from exceeding recoverable resources necessary to sustain a minimal scale economic recovery rate for the typical economic life of processing equipment. (This Byzantine language can be replace by numbers, instead.)

Multiple Tract Ownership — Its Problems

To suggest, as does the Department, that a prototype program originally intended "to make available under carefully controlled conditions a limited number of leases" needs the authority suddenly to offer up to five lease holdings to a single firm "if the additional prototype lease offerings . . . are to be successful" or that such concentrated resource ownership will encourage innovated technologies truly boggles the imagination.

The proposal will concentrate industry ownership of federal resources among a few firms. This is especially true if bonus bidding continues as the principal lease sale mechanism. The four currently leased tracts are shared by only seven firms. At least ten other major firms with a demonstrated interest in oil shale do not own federal leases, although several (Union, Chevron, Atlantic Richfield, Exxon, Mobil, Shell, Tosco) hold significant amounts of fee land or patented claims.

Related to ownership concentration is technological innovation. The Department of the Interior somehow has concluded that multiple lease ownership will encourage innovation. We disagree. The willingness to experiment with new processes or mining methods depends on reduced financial risk, not resource availability, and usually occurs outside a tract of land on which commercial development is required by diligence. Specialized financial incentives are most productive in encouraging innovation. However, making additional land for commercial development available to a company may have exactly the opposite effect. A company's capital resources will be strained by a single multi-billion dollar oil shale project. Multiple projects will increase total company risk and lead to a more conservative approach to management. It is unlikely that

the second tract will attract more than a few increased efficiencies in the original design used on the first tract.

Experience to date indicates that proprietary interest in technologies or favorable cost arrangements are the most important in the choice of processing technique by developers. Occidental and Union will use their own processes. Joint ventures which have included Tosco Corporation plan or planned to use the TOSCO II retort. Companies close to the Paraho operation will use that gas combustion process. Rio Blanco (Gulf & Standard of Indiana), originally without a proprietary process, purchased TOSCO. When they were force to shift to modified in situ, they tried to develop their own version of the public domain RISE method. Rio Blanco and Cathedral Bluffs, still lacking their own surface retorting technique, have recently turned to Lurgi, a process which has been tested only at very small scale, but whose patents recently expired.

The only promising new processes are two multi-mineral methods, Geokinetics's surface uplift in situ process, and microwave retorting. Some, especially microwave, is much too experimental to be ready for commercial a applications in near-future leasing. The others may require federal land, but multiple tract ownership legislation will reduce the probability of their obtaining needed federal lands.

WASTE DISPOSAL AND OTHER LAND USES OUTSIDE LEASE TRACT BOUNDARIES

There are several grounds on which to oppose the third administration proposal, authorization of public land use outside lease tract boundaries for shale waste disposal, processing facilities, and other purposes. We will explain why, and we will suggest some amendments to mitigate particularly objectionable provisions. However, we wish to make it clear that several undesirable features will remain, even after amendment, and we cannot accept any version of the concept.

Large Operations Encouraged

Allowing off-tract disposal will allow the expansion of at least one moderately sized operation to a monstrous 300,000 BPD open pit mining and retorting complex. Recently, in support of its effort to obtain off-tract disposal privileges, Rio Blanco has cited the larger mining volume in its new modified in situ technique as the reason for its renewed attempt to obtain this legislation. This begs the issue.

Rio Blanco originally intended to develop a 55,000 BPD open pit mine and retort project on tract C-a and then expand it to 300,000 BPD. Because of the off-tract disposal prohibition in existence and confirmed in 1976, it turned to MIS technology. Groundwater on the tract, however, has caused problems for Rio Blanco's MIS prject schedule. Originally scheduled for early spring 1980, its first experimental retort operation is still months away. It is possible that Gulf and Standard are delaying that burn until they know the outcome of this legislative battle.

Rio Blanco officials have admitted that they will return to open pit if this legislation is approved. We understand that they recently purchased Colorado Division of Wildlife land for inclusion in an open pit operation. C-a's estimated five billion plus barrels recoverable on tract with open pit mining (assuming off-tract disposal) is sufficient to sustain a 500,000 BPD operation for a little more than 30 years. Diagrams of the Rio Blanco plan reveal is immensity. The pit could, according to Rio Blanco, become the start

of a large moving pit which would advance across the Piceance Basin (See Figure 1). This is a fundamental ingredient in every multi-million barrel per day Armageddon scenario recently proposed — including concepts developed by Exxon, A. E. Lewis of the Lawrence Livermore Laboratory, and Malcolm Weiss of Massachusetts Institute of Technology. The impacts of such massive industries, according to recent testimony before the Senate Budget Committee, will adversely affect the entire West, reaching tentacles (and water conduits) as far away as South Dakota or the State of Washington.

Resource Recovery Inequities

The effect of off-tract disposal or facility siting is to increase the lessee's resource recovery on its own property at the expense of reduced resource recovery on the public's lands. In 1975, George Snyder of the U. S. Geological Survey pointed out that C-a's prime disposal site candidate overlies significant oil shale, nahcolite ans dawsonite reserves. He challenged arguments that 84 Mesa could not be mined by open pit methods. Some of Snyder's conclusions were questioned by the USGS Area Oil Shale Supervisor, who, however, did not challenge Snyder's contention that resource recovery factors must be given consideration in comparing alternative disposal sites.

Harold Malde of the Survey compared the reserves of 84 Mesa (the disposal site) with those of tract C-a:

Resource	C-a	84 Mesa
Oil from shale 25 gpt or richer	6.7 billion Bbl	7.6 billion bbl
Nahcolite from shale at 5% or above	negligible	412 million tons
Dawsonite in dawsonite bearing zones	338 million tons	430 million tons

Malde concluded, "Thus, granting that open pit mining would produce optimum extraction of resources from these sites, and that the national interest will demand the optimum mining methods must be used, it appears that the nation benefits from disposal on C-a."

In requiring that lessees pay fair market value for the use of off-tract lands, the bills before the committee partially address this concern. However, the bills are still insufficient. In determining fair market value, the Department must include the surface value of the land (for a permanent land use) and the opportunity costs represented by reduced resource recovery on the land being used for disposal or other permanent fixtures.

Citizen Challenges to Off-Tract Disposal Began Early

Tract C-a was sold to Rio Blanco on January 8, 1974. The lessees complain that before that date they were unaware that off-lease disposal might be illegal and cite the 1973 Final EIS on the Prototype Oil Shale Leasing Program as contemplating off-tract disposal. However, there were several citizen challenges to this concept much earlier. It is true that the legal position of the Department was clarified only after the lease sale; however, it is hard for us to believe that Gulf and Amoco were completely unaware of questions which were being raised. It is even more amazing to fathom how the prospective lessees of C-a could, nearly a year after the Alaska oil pipeline Supreme Court decision, believe that DOI could grant a special use permit to avoid the requirements of the Mineral Leasing Act.

The first mentions of off-lease disposal by the Department related to the possibility of disposal in the Douglas Creek area west of the Cathedral

Bluffs according to the draft EIS. This was protested by several citizens. The National Audubon Society in its written comments complained that plans for off-lease disposal "is a means of circumventing the maximum acreage provision (5,120 acres) for sites leased under the Minerals (sic) Leasing Act of 1920." DOI did not respond. (Volume V, Comment 38).

Because of the hypothetical nature of the EIS's discussion, little direct citizen action was forthcoming until just before the lease sale. In December, citizens met with State Director Dale Andrus to complain about the potential of off-lease disposal. This meeting was stimulated by the vague mention of off-tract disposal in the Secretary's November 30 notice of lease sale.

The first clear indication of the Department's intentions had to wait until late December. On December 21, 1973, the BLM filed a Notice of Proposed Withdrawal and Reservation of Lands for Oil Shale Purposes, C-19889. The proposed withdrawal would affect 6580 acres west of tract C-a. The action was not crystal clear. The withdrawal and accompanying press releases on December 26 did not specify the future use of the land. The Notice requested public comment, but the public was confused. Thus, about two weeks later, on the day after the lease sale, Carolyn Johnson, Elvis Stahr, and V. Crane Wright wrote to Dale Andrus seeking clarification of the Notice. One week later Andrus responded to Johnson. He said that the Final EIS had contemplated off-lease disposal and that the reasons for withdrawing the land were stated "by reference" to section 10 of the Notice of Lease Sale. In reply, Johnson pointed our that Section 10 of the Notice only refered to "Interior conducting investigations, studies and experiments related to oil shale disposal." Now, however, several weeks after the lease sale, the Department's intentions were finally clarified. The Colorado Open Space Council's subsequent comments blasted the idea.

In the meantime, Rep. Charles Vanik (D.-Ohio) pursued the controversy in Congress. On December 26, 1973, he introduced a bill to require on-site disposal. He also criticized Department plans. The day before the lease sale, January 7, 1974, he requested an opinion from the Comptroller General about off-lease disposal. It was Staats's January 30th reply which identified for the first time, for citizens, a definitive objection to off-lease dumping. GAO specifically indicated a violation of the Mineral Leasing Act if disposal did not take place on tract.

The Department of the Interior's apparently deliberate attempt to confuse the public regarding its intentions made it impossible for citizens to obtain an early ruling on the legality of off-lease disposal. Even so, the Department was on notice as early as October, 1972, that there was citizen concern about the attempted sidestep of the Mineral Leasing Act. The responsibility for delaying until after the lease sale any legal uncertainties for the lessee is shared only by the Department.

Off-tract Disposal is Not Needed for Tract Development

The currently approved plan for tract C-a contemplates a 76,000 BPD operation of combined modified in situ and surface retorting. Disposal will be limited to Rinky Dink Gulch on tract. If C-a retains the MIS option, it intends to change the MIS design to double mining and the spent shale which must be disposed. C-a's need for off-lease disposal under those conditions assumes that no attempt will be made to backfill abandoned modified in situ retorts, a strategy which can reduce surface waste disposal, may help reduce

subsidence, and may eliminate leaching of salts in abandoned MIS retorts.

The original development plan did not clearly quantify the needs for disposal for its open pit operation, on site disposal capacity, or other parameters which would help determine whether off-lease capacity was needed. However, it did include maps which identified the approximate extent of mining at projected 55,000 BPD levels after 30 years. Those maps indicated that sufficient room was available to accomodate all operations on tract. Before the end of thirty years, presumably, a public decision could be made concerning the future of leasing and disposal practices based on real experience. (See Figure 2.) If Rio Blanco intended only to maintain a small 55,000 BPD operation for 30 years, we are sure they would not be working so diligently for a change in the law. It is clear from their original development plan that this will not be the limit of their operations. (see page 7.)

Ironically, the 1973 Final EIS on the Prototype Program — which is legally sufficient for the evaluation of all impacts on tract C-a, according to recent court rulings -- also contradicts Rio Blanco's arguments. Volume III determines that the total acreage required for processing facilities, the open pit mine, and disposal of overburden and spent shale over a period of 16 years at 100,000 BPD or 30 years at 50,000 BPD is 4,400 acres. This is less than the tract size. Rio Blanco's initial mine plan proposes an operation of only 55,000 BPD. (EIS Volume III, p. IV-18,19)

One further argument is made for off-tract dumping by its proponents — the high cost of moving the overburden and waste twice. This is intriguing. One of the few advantages citied for an open pit development strategy is the ability to isolate spent shale from surface erosion and leaching. In order to accomplish this objective, the overburden must be moved twice. After backfilling spent shale into the open pit mine, overburden which is less susceptible to leaching problems must be moved from temporary storage to cover and isolate the spent shale. Evidently, the developers of tract C-a will avoid this possibly advantageous strategy as well.

If off-tract land use authority is granted, it clearly must be subject to a clearly demonstrated need. Both bills before this committee mention this test, but neither spells out criteria for need. This would be an important improvement in the legislation. We wish to ensure, also, that environmentally advantageous alternatives to off-lease disposal are approved prior to any off-tract permit. To do so requires statutory criteria for the determination of need. We suggest that lessees must demonstrate to the satisfaction of the Secretary that:

(1) Backfilling of the mine and mine workings or modified in situ abandoned retorts has been maximized consistent with mine safety and environmental protection, and one of the following:

(2)(a) On -tract disposal of spent shale or siting of the proposed land use on tract will be environmentally unacceptable, or:

(2)(b) Disposal of spent shale or siting of the proposed land use is infeasible or will prevent achievement of the minimum reasonably economic size necessary to test the proposed commercial development concept for the tract.

Formal Alternatives Analysis Necessary

One tool to evaluate the need and environmental acceptability of a proposed off-tract land use is an environmental analysis of disposal (or other land use) alternatives. Given our recent experience with the Department of the Interior, it is unlikely that it will do an adequate and publicly accountable analysis of the alternatives without some still legislative stimulus. Unfortunately, in EDF et al v. Andrus et al, the Department won its contention that because the original 1973 Prototype Program EIS "contemplated" certain vague impacts, that it did not need to analyze them in a site specific assessment of the development plan proposed four years later. Even though we believe that it should be difficult to stretch this interpretation of the court's opinion to the present situation, we have every expectation that the Interior Department will try if this legislation is passed.

Just because off-tract disposal was contemplated in the 1973 EIS does not mean that actual disposal alternatives were analyzed. The 1973 EIS did not even evaluate the 84 Mesa disposal site. It is quite clear that disposal options in 1973 were hypothetical:

> "While this area has been delineated as a possible disposal site, it is not intended to conclude that Water Gulch will be used. Prior to selecting disposal sites, detailed engineering, geological and environmental studies would be conducted and submitted for approval." Volume III, Chapter 3.
>
> ". . . A specific development plan for the minera property of the size being considered would require extensive detailed engineering studies of the type normally used for actual commercial mining." (Ibid.)
>
> "It should be emphasized that the particular canyons delineated might of might not be used. They were only chosen to depict the surface area requirements necessary for spent shale disposal. "
>
> "The figures used to describe the hypothetical plan are typical of actual design paramenters and have been developed to estimate probably environmental impacts."

Even though we believe that a reasonable interpretation of the law will require an EIS on disposal options, we think it would be best if the Congress makes this explicit. This concern is heightened by a March 1976 memo from a Colorado reclamation specialist to the Department of Natural Resources suggesting that the lessee's analysis of alternatives (the Interior did not perform one) was biased because it eliminated on-tract options from the comparison and because the methodology used was inappropriate.

It is important, therefore, not only to require that the disposal site be "environmentally acceptable" but that"

* The Secretary should evaluate disposal or land use alternatives for a number of sites and methods, including on-tract disposal, backfill practices and other waste management techniques, in an environmental impact statement, and select from among the alternatives that which exhibits the least environmental effects, the most favorable resource recovery balance, and acceptable costs. Such land use shall be approved only if it is consistent with the applicable federal land use plan.

The preparation of this environmental impact statement need not take a long period of time. Already available to the department is extensive baseline data, a detailed description and assessment of alternatives by the applicant, and other already prepared environmental documents. The analysis remaining consists of an identification of reasonable alternatives not considered by the applicant and a comparative analysis. This process may, in fact should, proceed in parallel with other approvals which would be required for a change in tract C-a's development plan, without delaying the final decision.

Finally, we believe it would be advisable to limit any off-tract disposal priveleges, if enacted, to 1974 lease holders only. Additional leases should encourage innovative technologies which do not require large disposal areas, such as multi-mineral processing. To allow dumping for future prototype leases will only encourage more of the same.

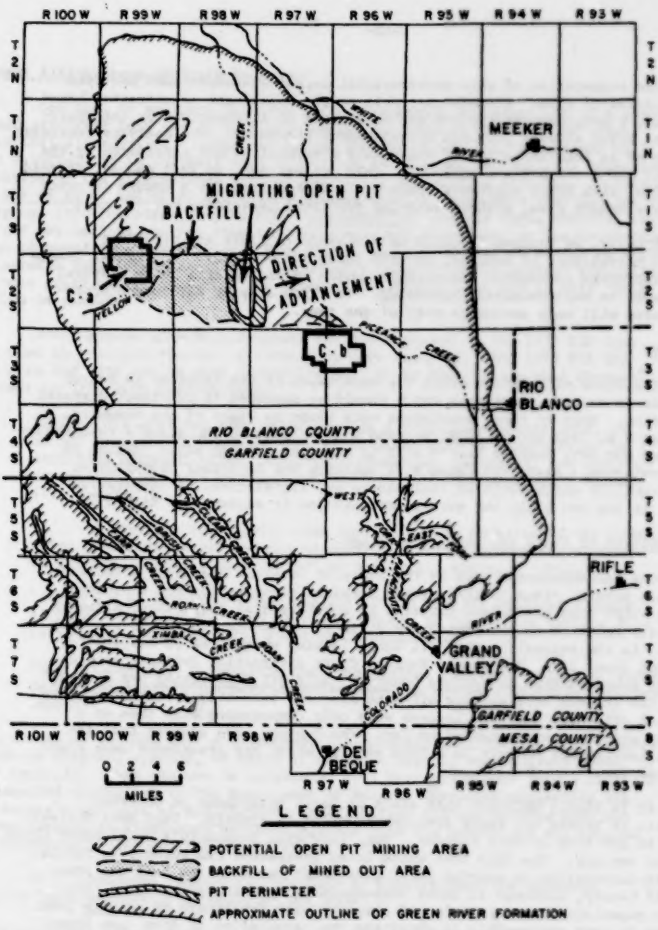
Overview

The State of Colorado wrote the Department of the Interior in May of this year to suggest provisions which should be included in off-tract disposal legislation. Many of those provisions make sense in light of our comments. Comparing H.R. 7941 and S. 2858, we find that on most of the state's recommendations and our own, Senator Hart's bill is superior, though still lacking in many provisions. Also, the House bill contains one important provision on transferability which sould be included in any legislation. A comparative summary is the two bills and our recommendations is attached as figure 3.

Applicability of State and Local Zoning Law.

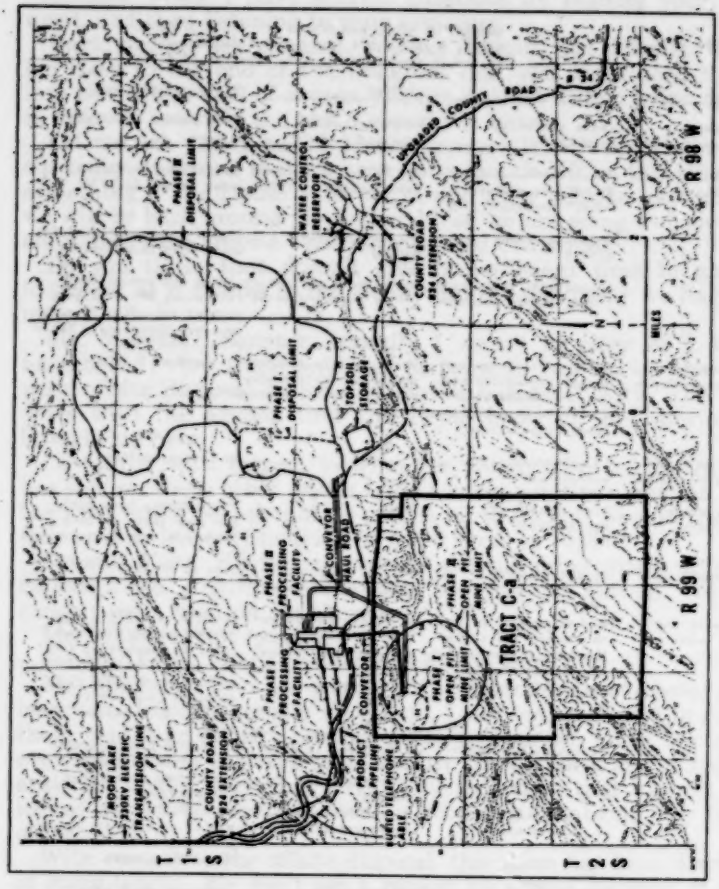
One recommendation made by the State of Colorado and local government officials several times in the ongoing sessions planning for new prototype leasing which does not relate directly to environmental protection, although it is very relevant to the protection of local residents from socio-economic impacts, is the suggestion that oil shale leasing operations be subject to state and local law. The recent Supreme Court affirmation (without opinion) of lower court rulings in Ventura County v. Gulf Oil Corporation has spurred on the the lessees here seeking off-site disposal authority to threaten state and local officials that the lessees were only cooperating with them as a courtesy which was not required by law. The Ventura case asserts that the Mineral Leasing Act amounts to a land use law which has precedence over state and local law.

It is highly unlikely that state or local government in Colorado will halt or hinder oil shale development which is orderly. They have actively sought it for five or more decades. But, they wish responsible development which pays its own way. The only tool which local government can enforce to obtain industry cooperation in meeting local government needs is the land use power. Garfield County, although it lacks comprehensive land use authorities, was able to negotiate from a position of strength with developers on private land. This was in part responsible in obtaining the cooperation of Arco (now Exxon) and Tosco in the construction of a new town for shale workers and other new residents, and in obtaining similar assistance from Union. For this reason, Congressshould grant the state and local government land use powers over the activities of federal oil shale lessees.



MOVING PIT CONCEPT, LATER PHASE SUCCEEDING TRACT C-a

Figure 1



LOCATION OF RBOSP FACILITIES IN VICINITY OF TRACT C-a

Figure 2

. Figure 3

SUMMARY OF HOUSE AND SENATE OFF-TRACT DISPOSAL BILLS, S.2858 & H.R.7941 and FOE Recommendations to Remove Some Objectionable Features of Bills*

Provision	S.2858	HR.7941	FOE Recommendations
Type of legal conveyance	Lease excluding minerals	Lease excluding minerals	FLPMA permit with FMV payment
Limits of applicability	"any person...currently holding a lease... under" prototype prog.	Any holder of a lease issued prior to 1985	"any person holding a lease issued in 1974"
Uses	Anything except mining	Anything except mining	Anything except mining for which need demonstrated.
Payment	Annual rent reflecting FMV of rights granted	Annual rent reflecting FMV of rights granted	Bonus and annual rent reflecting FMV of rights granted including resource recovery opportunity costs
Conditions on supplemental lease	Shall contain environmental protection provisions. Enumerates protections parallel to lease stipulations	Shall contain environmental protection provisions. No enumeration	Same as S.2858
Ability to lease minerals to others	If not incompatible with surface use.	Same	No recommendation
Lease of other federal lands	With consent of other agency	Same	Other agency must apply the same tests as contained in this legislation.
Transferability	No provision	Only if original lease is transfered.	Same as HR.7941
Legal tests for issuing lease or permit	a. Lessee will be able to conduct all operations in environmentally proper manner. b. Consult with Gov. c. Lessee has demonstrated need. d. Public interest e. no provision	a. After "consideration of environmental and resource values" b. no provision c. Proposed land use demonstrated to be "necessary and appropriate" d. no provision e. no provision	a. Same as S.2858, plus determination that disposal or processing site is best alternative. b. Same as S.2858, plus proposed land use is subject to local and state laws. c. S.2858 plus criteria for determining need (including maximizing backfill) d. S.2858 e. EIS to evaluate options and subject to FLPMA planning process.
Acreage Limits	6400 acres	no provision	Absolute limit plus criteria to establish lower thresholds.

* FOE opposes the proposed legislation, but offers these suggestions, which will be detailed in testimony, to make the legislation less objectionable.

Senator FORD. I have several questions by reading your statement, and then listening to your summary.

David, let me ask you this. You say flat out, just delay it. We are too close to the end of the Congress that you don't need to rush into this thing, and, of course, you are against it, and being against it, delay is probably the best weapon you have.

Let me ask you this. The House apparently will report their bill out today. It means that we have got a month left on this side to do something if the House votes on it, and then it looks like, appears we will be back around November 12, so we are going to have some additional time around Thanksgiving and Christmas.

Do you think that doesn't give us sufficient time to make a judgment as it relates to the House and the testimony we have had today?

Mr. MASSELLI. Senator, actually I wasn't as clear as I should have been. I view these proposals as being in two blocks. One deals with offsite disposal which the House has dealt with. The other deals with the agenda that the Department of the Interior has brought up here.

Certainly, with respect to what the Department of the Interior has said on these other issues I don't know what our position down the road would be—should we give it all to Exxon? Should there be four or nine leases? Should it be 5,000 acres or 10,000?

Senator FORD. Kevin has already got his mind made up on 30 gallons a ton. Anything below that, you just cut him off. We have already got a position out there.

Mr. MARKEY. Not exactly.

Senator FORD. That's basically what you said.

Mr. MASSELLI. In other words, with respect to those issues about lease size, lease ownership and so on, I can see no reason to go into them this year in part because I don't think we know enough to even face them right now. I'm sure that there are marvelous antitrust angles here that have to be looked at that haven't been looked at yet. No one has made a good argument one way or the other.

With respect to the offsite disposal, this issue has been discussed at some length. We don't see a reason for offsite disposal. If there is offsite disposal, I think we have made a series of recommendations about exactly how it should proceed.

I don't think that the House bill is adequate. I think that Senator Hart's bill contains some additional provisions which are helpful, I think at a minimum there needs to be the five steps that we have outlined and, quite frankly, again with respect to offsite disposal we don't necessarily see a reason to reach a conclusion on this by the end of this session. I don't think that Rio Blanco—we are dealing with basically a private bill here, and I don't think that Rio Blanco has come forth with the type of information that allows us to really analyze their plan. As they said to you earlier, they don't quite know how they are going to do this.

Let them at least come back with a pretty detailed plan and we can all look at it next February, but I don't see any reason to move forward on either of them, and with respect to some of DOI's more long-range proposals, it is not that we are opposed to them. We just

don't know where we will come out somewhere down the road. We don't know enough right now.

Senator FORD. Paula, you stated that leaving everything as it is, they would reach the proposed I think you said 300,000 barrels, and I think our hoped for would be 400,000?

Ms. PHILLIPS. That is what I certainly intended to say.

Senator FORD. I was looking at your statement. I was going through it pretty fast, but that includes both public lands or Federal lands and private lands to reach that. Of course, we are only dealing with the Federal lands in this piece of legislation.

Ms. PHILLIPS. Yes.

Senator FORD. You have no problems with the private operations?

Ms. PHILLIPS. I think that the fact that very few controls exist as far as the private developments magnifies the importance of the controls that we have for Federal development.

Senator FORD. I thought Colorado indicated earlier that they have a very good state plan.

Ms. PHILLIPS. State plan for?

Senator FORD. The whole operation; for instance, there are a lot of private operations as it relates to oil shale that doesn't include—at least I know of one—that doesn't include any Federal lands at all.

One of the things you objected to here is that the off-tract lands that we are talking about here gives them the authority for reservoirs, powerplants, communities, subdivisions and that sort of thing.

Let me ask you then: Should we just narrow the bill to off tract disposal and leave the rest of it out, just narrow the bill down to that and see if we can consider that and get it out and that would eliminate David's fears of all the things that the Department of the Interior brought in, and we really don't know whether they are good or bad yet, so just narrow it down to off-tract disposal areas or number of acres?

Ms. PHILLIPS. That would take care of some of our objections, but I don't think it would answer the problem of legislation of this sort being one more spur to even more rapidly increasing development, and I think a lot of people, and I would, certainly, never purport to speak for the State of Colorado, but I believe the State is also extremely concerned about the pace of development getting completely out of control, and I think that passage of this kind of legislation would threaten that result, and I think particularly in light of the fact that we just do not see any need for it at this time. I think it would be unwise.

Senator FORD. What about if we just narrowed the legislation down? Then you would let the President go ahead? You indicated they have done such a good job and we would be eliminating all their work and all the present statutes. Why don't we just leave that in place and go to off-tract disposal areas? We wouldn't be disturbing FLPMA which is already working according to what you have indicated in your statement.

Ms. PHILLIPS. FLPMA currently does prohibit such use of the land, so I think that would have to be taken care of.

Senator FORD. So, that would be the only item we would take care of as it relates to FLPMA. We have a letter here from the State stating that it doesn't object to the off-tract disposal of spent shale and for the location of oil shale processing facilities provided several items are included, and that is the Executive Director of the Department of Natural Resources in Colorado, and I think Senator Hart's bill, basically, includes the recommendations of the Department of Natural Resources in Colorado.

Are you familiar with their letter to us?

Ms. PHILLIPS. I am somewhat familiar with that letter. We, basically, have agreed with the suggestions that were made by Mr. Pasco, the Natural Resources Director, but believe that there should be some additional safeguards built into the legislation.

Senator FORD. Kevin says—you are from Colorado. Are you familiar with the letter?

Mr. MARKEY. Yes, Senator, I have provided to committee staff, to Tom here, a memo which evaluates the two different bills, the House bill and the Senate bill, Senator Hart's bill, in terms of whether or not they meet those various conditions, and Senator Hart's bill does meet some additional conditions, more conditions than the House bill, but not all of them are met.

For example, the State of Colorado requests that the best site, the environmentally best site, be selected from among a number of alternatives. The Hart bill does not specifically state that. It only states that whatever site is selected be environmentally safe. It does not require that it has got to be the best site.

The Hart bill does not require an environmental assessment or an environmental impact statement as we have stated. That depends on the interpretation of NEPA by the Department of the Interior, and we would suggest that at least some report language make it very clear to the Department that they had better do that sort of assessment.

Senator FORD. I think Secretary Josepn testified or answered my question they would require an EIS.

Mr. MARKEY. He said probably an EIS. He said that they would probably do an environmental assessment. We would prefer that the EIS—that is really a major Federal action and environmental assessments tend to get lost in the bureaucracy.

The State suggested that offsite disposal and operations under the lease, the leasing law be subject to State and local laws, especially land use laws, and that is not currently addressed by S. 2858.

There are a few additional recommendations that we have made which go beyond the State's recommendations such as a more clearly defined limit, type of applicability, to only the 1974 leases, criteria for demonstration of need, bonus component for the value and a few other things, but the Hart bill comes closest to our requirement, but not quite.

Senator FORD. Have any one of the three of you made any estimate of, in the disposal on tract, how much resource would be lost?

Mr. MARKEY. The resource would not ultimately be lost.

Senator FORD. It would be very expensive to get to, though. That would be my first impression.

Mr. MARKEY. That, certainly, has been the claim of the lessee, that it would be expensive to move that material twice. We believe that there are environmental advantages to moving that material twice, as a matter of fact.

Senator FORD. Environmental advantages?

Mr. MARKEY. There are environmental advantages, and that one of the reasons why we are asking for a good assessment of the various alternatives is to get information about the costs.

When Rio Blanco submitted their original detailed development plan, there was very little information available in there, or in supplemental information, or in discussions which came out later which gave an accurate indication of the sort of engineering data that you would require to make that sort of assessment.

The U.S. Geological Survey is capable of doing that sort of assessment and we think it ought to be required. As I stated, one of the few advantages for open pit development strategy is the ability to isolate spent shale from surface emotion and leaching.

Picture, if you will, the pit, the mined out pit, and placing the spent shale at the bottom of the pit, and then placing the overburden above the spent shale would reduce the exposure of that spent shale to erosion and other sorts of problems.

To do that, you have got to move that overburden twice.

Ms. PHILLIPS. I think also this resource recovery issue is another point that argues in favor of requiring backfilling to the extent feasible because to the extent that you backfill the mine, you, obviously, again uncover those resources that were covered when you originally disposed of the spent shale.

Senator FORD. Let me ask you a question. Since I am not a lawyer, I guess I can get some free legal advice here now. We have got two companies that have formed a consortium.

What's wrong with leasing the 5,100 plus acres to both of them to give them 10,000 plus acres and part of that second 5,000 be off-tract disposal? Wouldn't they have the ability to do that, David?

Mr. MASSELLI. I think the problem, if there is any, is that if you are in the business of leasing this land, and all this land has important oil shale resources on it, and your statute tells you to get a fair market return, that you are going to be asking for a lot of money for it.

What you have here really with Rio Blanco, and it has to be recognized, they want a piece of land that is just as big as the piece of land that they paid $210 million for 7 years ago that would probably go for $1 billion on the market now, instead of having to pay for the shale resources.

Senator FORD. That's what you call a good investment.

Mr. MASSELLI. They are not nearly as bad off as they might have you believe. Instead of having to pay for the shale resource on it, they want to pay for the use of the surface. In other words, they want to have their 5,000 acre lease for which they paid $210 million, and then they want to have another 6,400 acres which is just as valuable perhaps as shale land, but they want to pay a much reduced amount of money just to have the top of it, although having the top of it may prevent you from mining it.

The reason that you wouldn't get the situation that you just outlined of two partners, and he and I decide that he will take one

tract and mine on it and I will take one tract and use it for disposal is, I am going to have to pay through the nose for that second tract because I am going to be charged for that tract as if it were an oil shale tract, and given that, I am not likely to use it just for disposal. I am likely to want to get a return on my investment. That is why it wouldn't happen as a practical matter. I would only do it if someone said you can get this land cheap, not if you can get it for what the shale resources were.

Senator FORD. Is there any adjacent land you could get cheap?

Mr. MASSELLI. No; because as you saw from the earlier discussion, this land is right in the area where you have got 1,250 feet of shale, so there is no cheap land, or there shouldn't be.

Mr. MARKEY. Picture if you will instead of this land being publicly owned, it is privately owned, and you have got two different tracts of fee land sitting next to each other. Both of them can be mined by open pit. The owner of tract A wants to develop his land first. He goes over to the owner of tract B and says I would like to use your land for the disposal of my spent shale and overburden.

The owner of tract B is not going to only sell him the surface rights. Tract B is going to try to get the price of the entire tract, including the mineral rights, because his access to those minerals may possibly be denied in the future.

In that sense, your suggestion that yes, coming up with a second tract and allowing them to do that, does internalize the costs of tract disposal, of spent shale disposal in that company or in that joint venture, but as David has suggested, it is not likely that they are going to want to do it that way.

Senator FORD. How restricted now is your 30 gallons per ton?

Mr. MARKEY. Did I state 30 gallons per ton?

Senator FORD. That is what I thought you said.

Mr. MARKEY. What I was pointing out——

Senator FORD. You talked about high grade.

Mr. MARKEY. What I was pointing out was that when the Department delineates a tract on the basis of how much shale of over 30 gallons per ton is sitting on that tract, you are going to get a lot of resource. There is going to be enough resource there to develop a mine for an economic life period, a sizable mine, over a reasonable amount of time, using only the 30 gallons per ton.

There is also going to be a lot of lower grade shale which should be recovered, and when the Department of the Interior only counts that 30 gallons per ton which we think should not be done, when they only include that, they are encouraging the developer who can go ahead and build an economic recovery unit just with that 30 gallon plus shale, it encourages that developer only to use the high grade or not to use the low-grade oil, so it is just the opposite of what you perceived I said.

Senator FORD. That is what we call communications.

Mr. MARKEY. We try.

Senator FORD. In this layer that was described earlier, is there any difference in the quality of the top layer that extends—is the higher quality in the narrow sense at the bottom of the so-called valley? Is the quality any different there or is it higher there or lower than it is out in the fringes?

Mr. MARKEY. The quality varies throughout the basin.

Senator FORD. You mean if I got to cut a strip about 10 feet wide and went all the way from one to the other end and down to the bottom, that the difference in the quality would be from the top to the bottom or from outside toward the middle or how?

Mr. MARKEY. Both, essentially.

Senator FORD. What you told me then was that if we get to 30 gallons per ton, that we ought to go ahead and get the rest of it?

Mr. MARKEY. We want to maximize the resource recovery to the extent that we can, but at the same time you have got to do that with an eye to the equity of the public and the fair return to the public, not just a fair return to the developer.

Senator FORD. What is the cost? What is the cost of on tract disposal for removal to get to the shale? I asked you what the loss would be and you said there wouldn't be any loss, it would just be additional cost to get to it or it may prevent, because the cost is so prohibitive, going after the additional shale.

Do you have any ball park figure as to the additional cost of the on tract disposal?

Mr. MARKEY. I really don't. In fact, I looked for a couple of weeks for some information in all of the files that we have on the debates over off-tract disposal, and we found some information in terms of the amount of overburden which would be moved, in terms of the amount of spent shale which would be moved and things like that, but there was no cost in terms of the tonnage cost or anything like that, that we could figure that out with. That is one of the things that we would hope would be evaluated in a Department of the Interior assessment.

Senator FORD. There are an awful lot of questions.

Mr. MARKEY. There really are. Half of my testimony is questions.

Senator FORD. I'm good at asking questions and very poor at giving answers. There is an awful lot of money being spent to try to help this country's energy situation.

Are there any tradeoffs?

Ms. PHILLIPS. Any tradeoffs between?

Senator FORD. You know what a tradeoff is. I will go do that and you will let us have that.

Mr. MARKEY. I think the main thing that we have to do is develop these options in an orderly manner. Let me give you an idea.

Senator FORD. We have been trying for years to develop something in an orderly manner.

Mr. MARKEY. There is a lot of different definitions of what orderly is, and we at least have had the opinion that orderly should include development according to free market economics; in other words, limited support or no subsidies, and according to environmental regulations, and there are views that are different from that, including a weakening of environmental standards or the increased, various increased subsidies.

The tradeoffs I suppose are not between having energy and not having it, but between various energy options, and to somewhat remove from the specifics of this proposal, I point out some numbers that are in the Office of Oil Shale, Office of Technology Assessment. Look at oil shale. This is the big, thick volume. They point out that a small 400,000 barrels per day industry or establish-

ing that industry by 1990 will require the commitment of 12 percent of equipment manufacturing capability, and about 12 percent of the plant construction and design services in the Nation.

Oil shale is only one fifth of the synfuels effort. You multiply that out and you get up to 60 percent with both of those sectors, and other synthetic fuels would be similar to oil shale. To make that sort of commitment is substantial. To expand beyond that commitment is going to make it difficult to meet other requirements of solving our economic problems, including housing shortages, retooling of the auto industry, retooling of the steel industry, our military requirements, et cetera, and also the other energy alternatives—solar, biomass, et cetera.

Senator FORD. If we don't settle our energy problems, the others are not going to come around very fast. Let me ask you a quick question. I have a real interest in coal, as all three of you know. I don't think you like what I do, but nevertheless, I am going to keep on trying. You are going to try to prevent me so we will let that fall, but we are talking about a rule of thumb of three barrels of high grade crude from a ton of coal, and you are talking about 30 gallons or 25 gallons of oil from a ton of shale.

Are you all violently opposed to synthetic fuels from coal?

Mr. MASSELLI. As a matter of fact, I think it is safe to say that we are not violently opposed to synthetic fuels from coal.

Senator FORD. Will you stop right there now? I just will thank the witness and adjourn the meeting.

Mr. MASSELLI. But when we look at a synfuels plant, we look at a couple of things. We look at where the coal is coming from, how it is getting to the plant and what kind of process is used.

I, for example, have always been an enthusiastic supporter of the use of eastern high sulfur coal for gasification because it takes a resource which is abundant which is in an area with an appropriate infrastructure where there is a mining history, and it gives us from that a very high-grade environmentally sound energy source.

Senator FORD. And a very efficient source.

Mr. MASSELLI. My views on someone who wants to build a gasification project on a Navaho burial ground would be somewhat different from my views on someone who wants to build one——

Senator FORD. Ken, we will remove the cemetery if we want to build one there. That's farfetched. I don't think anybody wants to build a gasification plant over a Navaho burial ground. If they do, you just let them come down to Kentucky or some of our Eastern States and we'll try to furnish them the high sulfur coal to make the oil and the gas, but I'm glad to know that you're on my side. I will be glad to discuss this with you at a future date when some of our legislation comes up.

We are not very far apart, are we?

Mr. MASSELLI. I had the opportunity to testify on the coal gasification before another subcommittee a few weeks ago, and even though you were not present, my statements were similar. You have to take these things one at a time. There are good projects and bad projects.

We look at oil shale and we see a few projects which we know will be developed which we think can be developed in an environ-

mentally sound fashion, and which we are not in main part fighting against.

We look at some other projects, and a large open pit mine would be one of them, and we view them as much less acceptable than say projects which some of the competitors of Rio Blanco are moving forward with. I think the issue has moved from whether to have synthetic fuels to how you manage synthetic fuels, and that has been an interesting transition for all of us to make.

There aren't easy blanket answers. You have just got to take them as the blueprints come in.

Senator FORD. I have two statements to make and we'll go. I want to include the statements of Senator William Armstrong and the Rocky Mountain Chapter of the Sierra Club into the record.

[The prepared statements of Senator Armstrong and the Rocky Mountain Chapter of the Sierra Club follow:]

STATEMENT OF SENATOR WILLIAM ARMSTRONG
ON OFF-TRACT OIL SHALE LEASING BILL
BEFORE SENATE ENERGY COMMITTEE, 9/9/80

Mr. Chairman. I am pleased to have this opportunity to discuss with the Committee the bill which Senator Hart and I have co-sponsored, S. 2858, to permit holders of prototype oil shale leases to lease additional nearby lands for the purpose of constructing processing facilities and disposal sites, so that valuable oil shale properties do not have to be used for this purpose.

It is not necessary to repeat the unacceptable political, national security and economic implications of America's excessive dependence on foreign oil. Several other points, however, may merit repeating.

First, although the volume of oil imports has declined rather markedly during the past year, we will actually pay more this year for foreign oil, because OPEC and other producing nations continue to raise their prices, as Saudi Arabia did just last week.

Second, declines in current domestic oil production are continuing and may soon begin to offset the gains made by energy conservation. In fact, production at the huge Prudhoe Bay Oil Field is expected to begin declining around 1986.

Third, and most importantly, domestic energy resources abound and could reverse these declines and help reduce our oil imports much further if we would simply begin developing them. One of these resources is oil shale and, if we begin to act now, commercial production of this resource could begin to occur at about the same time that our other domestic production really begins to suffer.

The United States Interior Department estimates that 600 million barrels of oil are presently recoverable, using known technology, from a resource base of 1.8 trillion barrels located in several major deposits on some 17,000 square miles in Colorado, Utah and Wyoming. This 600 billion barrel figure is roughly equal to all the known worldwide reserves of conventional oil.

The legislation which Senator Hart and I have co-sponsored seeks to take a modest step in the direction of proper, orderly and environmentally sound development of this resource.

S. 2858 provides the Secretary of the Interior with the authority to lease additional lands to lessees involved in the Federal Prototype Oil Shale Leasing Program, for oil shale retorts, other facilities and disposal sites for overburden and "spent" oil shale. The additional lands are necessary if maximum resource recovery and proper environmental management are to occur.

For example, if plant facilities and disposal sites must be located on a tract which overlies some of America's richest oil shale deposits, as is currently required under the 1976 Federal Land Policy and Management Act, a significant portion of the oil shale resource would not be recoverable. Placing the plant, disposal site and other facilities directly over the oil shale deposits would clearly preclude surface mining of large areas. Even subsurface mining would be seriously affected, since far more shale would have to be left behind to keep the mine from caving in.

This represents a tremendous and unnecessary waste of a highly valuable resource.

Environmental considerations also argue strongly for off-tract leasing. If more land is available for leasing, the least environmentally sensitive areas can be selected for surface facilities and disposal sites, and plant, wildlife and water resources can be better protected.

Therefore, it seems most logical to place the plant facilities and disposal sites off the oil shale tract but adjacent to the original leased area. S. 2858 provides for this approach.

The approach Senator Hart and I have taken differs in several respects from the other bills which the Committee will consider today.

The Administration's bill (H.R. 7857) is much broader in scope than ours and addresses multi-mineral leasing and the current limitation of one oil shale lease per person or corporation, as well as the off-tract leasing issue. While these are issues that deserve consideration, my primary concern right now is with the Prototype Program, which cannot proceed any further until authority is granted for off-tract leasing. In the interest of getting a bill passed this year, I feel we should focus on this most important issue.

S. 2858 is also slightly different from the bill (H.R. 7405) which Congressman Marriott introduced in the House and which has already been reported out by the Committee on Interior and Insular Affairs. S. 2858 imposes a limitation of 6400 acres on the amount that can be leased under the off-tract authority; however, this limitation will pose no problems under the Prototype Oil Shale Leasing Program. Second, S. 2858 adds an important provision for consultation with the governor of the affected state, to insure federal-state cooperation on these major energy activities. And third, S. 2858 includes somewhat more detailed coverage of important environmental protection issues.

I believe these distinctions, though limited, are important and urge the Committee to consider them favorably.

The Prototype Program was initiated in the early seventies as a response to our nation's excessive dependence on foreign oil. It was designed to answer many of the questions that responsible parties have posed concerning shale development. It is now time to move forward and remove some of the obstacles to proper and orderly development, so that the Prototype Program can provide information on the questions it was designed to answer.

I strongly recommend speedy passage of this important legislation. Thank you for this opportunity to comment.

Sierra Club
Rocky Mountain Chapter
2239 E. Colfax Ave.
Denver, CO, 80206
303-321-8292
"...TO EXPLORE, ENJOY AND PRESERVE THE NATION'S FORESTS, WATERS, WILDLIFE AND WILDERNESS..."

Sept. 6,1980

Senate Subcommittee on Energy Resources
and Materials Processing
c/o Senator Wendell Ford
Rm. 3106
Dirksen Senate Office Bldg.
Washington, DC, 20510

Dear Senator Ford,

We would like to enter the following remarks into the September 9 hearing record on H.R. 7857,- the Administration's proposal to facilitate additional leasing in the prototype oil shale program. They are made on behalf of the Rocky Mountain Chapter of the Sierra Club, an organization with 3000 members throughout the State of Colorado.

We approach the concept of additional prototype leasing with the following attitudes: first, an often-expressed opposition to the present massive emphasis on synthetic fossil fuels instead of conservation, and second, a central concern for the protection of the very fragile and scenic mountain environment of Colorado. We have little doubt that <u>any</u> shale industry will have unwanted impacts, and no doubt at all about the consequences of an industry larger than about 400,000 barrels per day. The latter fears tend to be shared by the State government, increasingly by local Western Slope governments, and have been supported by several studies. The most recent of these is the excellent June, 1980 "An Assessment of Oil Shale Technologies" by the Office of Technology Assessment; it makes clear that in most areas of concern the "breaking point" occurs in the 200,000-400,000 bpd range. Even today, before large scale oil shale development, the present boom in oil,gas,coal, and minerals is straining social resources on the Western Slope. For these reasons, the Sierra Club and other groups are on the look-out for the "thin edge of the wedge".

Enter DOI's May, 1980 decision to press for additional leasing in the prototype program and to begin to set up a permanent program. Whatever the realities, this action has the distinct <u>appearance</u> of being motivated by election-year politics, of being an attempt to fast-track willy-nilly development over, around, or through legitimate public concerns, and of being just another vehicle for open-pit mining.

Our attitudes cannot be correctly characterized as a simple-minded opposition to all oil shale development. <u>If</u> a thoroughgoing national debate leads to a consensus that some oil shale production is necessary(and we have the obligation to always keep that basic question before the public), then our position has been that development should proceed at a measured pace, with modular steps, and maximum information generation and impact evaluation at each step; present and future environmental protections must not be compromised. Some of the modular development might usefully include a multi-mineral process. We doubt that much new will be learned from open-pit mining, unless DOI intends to test procedures for as-contemporaneous-as-possible mining, back-filling, and revegetation, with off-site disposal minimized. An experimental, modular, multi-technology approach

was allegedly the goal of the original Prototype Program, but it seems to have been at least a partial failure; skepticism abounds in our ranks that additional leasing will yield better results.

We are pleased that the Mines and Mining Subcommittee has been less than enthusiastic about H.R. 7857. Many of the provisions deleted by that subcommittee, for example, larger than 5120 acre lease tracts, seem clearly unnecessary if only a prototype operation is contemplated. Such provisions are best relegated, if at all, to any future permanent leasing program. However, we are opposed to that subcommittee's approval of off-site dumping, because it is mostly useful only for open-pit mining, and this technology as it is proposed to be practiced destroys too much land and poses fugitive dust and mine dewatering problems.

There is surely a better way ! On the planning/public involvement axis, that "better way" appears to be the BLM's recent land use planning draft document, and on the technology axis, DOE's funding of modular developments on present oil shale properties.

In summary, we urge Congress not to pass legislation to support an additional leasing program that is too hasty and too harmful. In particular we oppose legislation that would encourage open-pit mining of the conventional sort. Thank you for your consideration of these views.

Sincerely,

Kirk Cunningham

Kirk Cunningham
Conservation Chairman

Senator FORD. Unless you object, next time I see you I am going to put you first on the list. You have been last on the list every time I have held a hearing, and I think that's flip of the coin, but you are going to go first, and let the company shoot at you.

It seems like it happens every time that you are here, and we get a vote. It is 12:30.

Mr. MARKEY. It will be nice to be first for a change.

Senator FORD. The next time I hold a hearing and you are one of the witnesses, you go first—anybody who comes from Denver.

Mr. MARKEY. I am not staying here.

Senator FORD. We will adjourn the hearing. There may be some questions that come up that we will want to send you.

Mr. MARKEY. Thank you, Senator.

[Whereupon, at 12:32 p.m., the hearing was adjourned.]

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